



2006 Annual Report Supplement



SUSTAINABLE DEVELOPMENT
TECHNOLOGY CANADA™

Supplement to the 2006 Annual Report

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Associated documents available on our website www.sdtc.ca

2006 Annual Report

2007 Corporate Plan Executive Summary

Introduction

In accordance with the terms and conditions of the third Funding Agreement between Sustainable Development Technology Canada (SDTC) and the Government of Canada, executed March 31, 2005, SDTC is required to publish an Annual Report Supplement, in addition to the Annual Report, to provide specific supplementary details of projects funded by SDTC. Within this supplement, SDTC has provided the required information.

This Annual Report Supplement is to be made public and tabled in Parliament along with the Annual Report and the Corporate Plan Executive Summary. In addition, all of these documents will be made available on SDTC's website.

Selection Criteria

This section provides key information on the selection criteria for Eligible Projects. These criteria are detailed in SDTC's third Funding Agreement which was brought into force March 31, 2005 and was applied to rounds 2005B and 2006A and will be applied to all future rounds unless modified by agreement between SDTC and the Government of Canada. The most notable change in this regard from the previous Funding Agreements was the increase in SDTC's scope to include technologies addressing water and soil quality.

Eligible Recipient

For the sole purpose of receiving money from SDTC and not for any other purpose, a recipient, other than an Excluded Recipient, that has expertise in Sustainable Development Technology and is:

1. a for-profit corporation, a partnership, a limited partnership or a business trust and has entered into a contract relating to the carrying out of an Eligible Project with one or more of the following legal entities:
 - another corporation;
 - a partnership, a limited partnership or a business trust which has expertise in Sustainable Development Technology;
 - a university, a college or another provincially accredited post-secondary educational institution;
 - research institute;
 - an individual who has expertise in Sustainable Development Technology;
 - a not-for-profit corporation, one of its purposes being to undertake, fund or otherwise support the Development or Demonstration of Sustainable Development Technology; or
2. a for-profit corporation, a partnership, a limited partnership or a business trust, and one or more of the following legal entities:
 - another corporation;
 - a partnership, a limited partnership or a business trust which has expertise in Sustainable Development Technology;
 - a university, a college or another provincially accredited post-secondary educational institution;
 - a research institute;
 - an individual who has expertise in Sustainable Development Technology;
 - a not-for-profit corporation, one of its purposes being to undertake, fund or otherwise support the Development or Demonstration of Sustainable Development Technology;
 - which have entered into a collaborative arrangement for carrying out an Eligible Project and are applying jointly to SDTC for the purpose of receiving money from SDTC; or,
3. a not-for-profit corporation, one of its purposes being to undertake, fund or otherwise support the Development or Demonstration of Sustainable Development Technology.

Eligible Projects

A project, to be an Eligible Project, must be carried on, or primarily carried on, in Canada by an Eligible Recipient to develop and demonstrate new technologies to promote Sustainable Development, such as:

- technologies related to energy end-use technologies, such as transportation and building technologies, and technologies to reduce ground level ozone;
- technologies related to the hydrogen economy, such as mobile and stationary fuel cells, the production, distribution and storage of hydrogen as well as transition fuels and related technologies;
- technologies related to the sustainable production of fossil fuels (“clean fossil fuel technologies”), such as the efficient combustion or conversion of fossil fuels (including advanced coal gasification), CO₂ capture and storage, more efficient technologies for surface and in-situ oil sands production, and access to frontier and unconventional natural gas resources;
- Renewable energy technologies, including biomass, solar, wind, wave and tidal technologies;
- Greenhouse Gas emissions reduction technologies related to areas other than energy production and use, including technologies to reduce CO₂ in cement manufacturing;
- Air quality improvement technologies, including toxic substance recovery systems, particulate control technologies and acid rain technologies;
- enabling or cross-cutting technologies, including sensors and controls, closed loop process waste, or air, Water or Soil treatment technologies, and process technologies for the purpose of increasing energy efficiency;
- Water quality and quantity improvement technologies, including, the conservation of Water and the disinfection and the mitigation or abatement of Contaminants in Water, sewage or sludges generated in the treatment of Wastewater or potable water; including associated equipment for detection, quantification, analysis and calibration;
- Waste management technologies, including those designed to prevent, reduce, or eliminate solid waste generation or discharge, as well as materials recovery processes, composting, thermal treatment, and biotechnology-based systems, and associated equipment for detection, quantification, analysis, and calibration; or
- Soil quality improvement technologies, including the Remediation of Contaminants in Soil and Sediments, through containment, removal, recovery, reduced bio-availability, and destruction methods applied either in-situ or ex-situ using physical, chemical, thermal or biological processes, and associated equipment for detection, quantification, analysis, and calibration.

Funding Criteria

The Foundation must only award funding to eligible recipients who demonstrate that:

- the proposed project is technically sound and will, in the opinion of the Board, result in the Development or Demonstration of new Sustainable Development Technologies;
- the Eligible Recipient brings together the necessary technical, financial and management capacity to successfully undertake the Eligible Project in a collaborative and innovative manner;
- the funding by the Foundation is necessary to ensure that the Eligible Project proceeds within the scope, with the timing or at the location necessary to ensure that significant broad benefits accrue to Canadians nationally or regionally; and
- the Eligible Recipient has provided a description and assumptions for the timely diffusion and deployment in relevant Market Sectors of the new Sustainable Development Technology resulting from the proposed Eligible Project and any related incremental Intellectual Property.

Contents and Assessment of Application

Eligible Recipients must describe to the Foundation, the manner and extent to which the selection criteria will be met. The application must address:

- Technology: a description of the new technology that will be developed or demonstrated, any related existing, new or incremental Intellectual Property, an abstract of related existing technology, the scientific and technological basis upon which the proposed project has been developed, the intended application of the proposed project and a detailed work plan;
- Sustainable Development Results: the estimated Sustainable Development impacts that would accrue from the proposed project (i.e. positive and negative environmental, economic and social impacts) taking into account the expected contributions in areas such as enhancing environmental quality and stewardship, supporting economic development, furthering innovative Sustainable Development Technologies, practices and processes, protecting human and ecosystem health and improving the quality of life of Canadians. For clarity, this will include the quantification and description of the expected Project Impacts and the expected Market Impacts of the proposed project;
- Technological Diffusion: a description and assumptions for potential diffusion of the new technology, its advancement in the marketplace, time lines, mechanisms for handling Intellectual Property and implications for potential end-users;
- Collaborative Arrangement: the names, roles and responsibilities of the parties comprising the Eligible Recipient and any government or foreign collaborators, the roles and responsibilities of the Eligible Recipient itself, the technical, management and other capacities of the Eligible Recipient and its members to undertake and complete the proposed project and the involvement of any small and medium-sized enterprises;
- Financial Management: time lines and projected expenditures and benefits for the proposed project, projected Eligible Project Costs, project financing in place and requested or anticipated to be requested from all sources (including SDTC), approach for respecting contribution requirements, projected cash flow arising from the Eligible Project and the proportion of Eligible Project Costs to be assumed by each party comprising the Eligible Recipient;
- Environmental Assessment:
 - where the proposed Eligible Project requires an environmental assessment under federal, provincial, territorial or municipal legislation, a summary of the results of the required environmental assessment;
 - where the proposed Eligible Project does not require an environmental assessment under federal, provincial, territorial or municipal legislation, a statement from the Eligible Recipient indicating that a self-assessment of environmental impacts was conducted and that any necessary mitigating measures will be implemented;
- Legislation: confirmation that the proposed Eligible Project complies with all federal, provincial/territorial and municipal legislation; and
- Other Requirements: assessment of project risks and a description of measures that will be used to manage same, a summary of the results of audits, feasibility or engineering studies completed in the preparation of the Eligible Project proposal, and an assessment of trade and competition impacts, including compliance with international agreements.

Conflict of Interest and Non-Disclosure Requirements for SDTC's Funding Allocation Process

All due diligence and decision making processes at SDTC require that the individuals involved are subject to conflict of interest guidelines and non-disclosure agreements. This is applied consistently whether the individuals are experts reviewing applications or part of the SDTC organization. It should be noted that Members of the Board are also subject to conflict of interest guidelines that require Directors to declare potential conflicts of interest and refrain from participating in any discussion regarding matters that could give rise to a conflict of interest.

More detail on the funding process can be found at www.sdtk.ca

SDTC Portfolio Project Descriptions

The following provides a brief description for each project approved for funding by SDTC's Board of Directors for all rounds since the commencement of the Foundation's activities. This report provides an update of SDTC's total project portfolio of allocated funding as of December 31, 2006, including Rounds 1 – 2002A to 9 – 2006A. The rounds specifically approved in 2006 are Rounds 8 – 2005B and 9 – 2006A.

Biothermica Technologies Inc.

Round 9-2006A

Environmental benefits: Climate change / Clean air / Clean soil

Total Project Value:
\$7,700,589

SDTC Funding:
\$2,543,937

Leveraged Funding:
\$5,156,652

Biomass Gasification Unit

Biothermica will develop, build, and operate a pilot plant designed to convert 35,000 tonnes per year of construction, demolition waste, and other urban wood waste to clean synthetic gas. The gas will be used in combination with landfill biogas in the Gazmont 25 MW power plant in Montreal. This demonstration will show the viability of coupling a fluidized bed high pressure gasifier to an industrial steam boiler for use in power generation.

Consortium Members

Biothermica Technologies Inc.
Gestion Gazmont Inc.
Dynatech, Services de gestion de l'énergie Inc.
SNC-Lavalin Environnement Inc.
Biothermica Énergie Inc.

CCR Technologies Ltd.

Round 9-2006A

Environmental benefits: Clean air /Climate change / Clean soil

Total Project Value:
\$3,731,720

SDTC Funding:
\$1,190,420

Leveraged Funding:
\$2,541,300

Removal of H₂S from Gas Streams

CCR Technologies will demonstrate the use of a proprietary catalyst and process for the removal of hydrogen sulfide from gas streams arising from oil and gas production. The same technology can be applied to waste gas streams from landfill sites and water treatment plants. Compared to current technology, the new process is expected to significantly reduce the cost for removing sulphur from these sources.

Consortium Members

CCR Technologies Ltd.
Alberta Research Council Inc.
National Research Council
CETAC-West
Synergas Inc.
Canadian Natural Resources Ltd.
EnCana Corporation
Glencoe Resources Ltd.

Dynamic Systems Inc.

Round 9-2006A

Environmental benefits: Clean air / Climate change

Total Project Value:
\$15,195,399

SDTC Funding:
\$4,258,800

Leveraged Funding:
\$10,936,599

Transmission-less Hybrid Drive System

Dynamic Systems Inc. (DSI) will develop and demonstrate a transmission-less hybrid drive system (THDS) incorporating a Multi-stage Switched Reluctance Motor and energy management system to replace current mechanical transmissions in Class 4-6 and Class 7-8 commercial transport vehicles. The problem of motor vibration has been overcome in the DSI Multi-Stage© design. Use of the DSI THDS technology in combination with hybrid electric power trains has the potential to reduce the consumption of diesel fuel by up to 60 per cent.

Consortium Members

Dynamic Systems Inc.
International Truck and Engine Corporation Canada
Archonix Corporation

E.I. du Pont Canada Company**Round 9-2006A****Environmental benefits: Climate change / Clean air / Clean soil**

Total Project Value:

\$3,207,840

SDTC Funding:

\$1,058,587

Leveraged Funding:

\$2,149,253**KEVLAR® Engineered Elastomer for Tire Treads**

The scope of this project is to develop and demonstrate the KEVLAR® Engineered Elastomer (KEVLAR® EE) process in a tire tread compound, and the benefits of using KEVLAR® EE versus existing technology. KEVLAR® EE is capable of reinforcement in multiple directions, unlike currently used synthetic fibres (which reinforce only in one direction). Dispersing the pulp to ensure an “open structure” results in increased abrasion and tear resistance, and other properties that could result in up to a 40 per cent improvement in tread wear and a 10 per cent reduction in rolling resistance of vehicle tires thus increasing fuel efficiency.

Consortium Members

E.I. du Pont Canada Company

AirBoss of America Inc.

TMH Logistics Inc.

Enerkem Technologies Inc.**Round 9-2006A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$8,097,161

SDTC Funding:

\$2,660,476

Leveraged Funding:

\$5,436,685**Sustainable Alcohol Facility**

A sustainable alcohols facility will be erected in East Angus, QC, using a gasification process to convert biomass such as municipal solid waste, sludge, treated wood waste, and construction and demolition wood into alcohols (methanol and ethanol). The facility will also process residual forest and agricultural biomass. The demonstration plant will treat 12,000 tonnes of biomass-rich residues per year and produce 4 million litres of alcohols per year. It is expected that a successful demonstration will be followed by a commercial plant at the same site producing 50 million litres of alcohols per year.

Consortium Members

Enerkem Technologies Inc.

Abengoa Bioenergy R&D Inc.

Novera Energy Ltd.

Tred'Si Inc.

GE ZENON ULC**Round 9-2006A****Environmental benefits: Clean water / Climate change**

Total Project Value:

\$7,019,867

SDTC Funding:

\$2,316,556

Leveraged Funding:

\$4,703,311**Gravity Membrane for Sand Filter Retrofit**

Zenon will develop and demonstrate a low pressure ultrafiltration hollow membrane water treatment technology. This new technology provides increased plant throughput and dramatically improved water quality over conventional sand filtration. The technology is an adaptation of the existing Zenon “ZeeWeed” technology that can be installed in existing potable water treatment plants to improve water purity and to meet increasing demand. The goal is to reduce water treatment plant expansion costs and to avoid expanded use of urban or shoreline land.

Consortium Members

GE Zenon ULC

Regional Municipality of Peel

University of Guelph

Pro Aqua + Shadrac

General Electric Canada Inc.**Round 9-2006A****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**

Total Project Value:

\$7,660,000

SDTC Funding:

\$2,553,000

Leveraged Funding:

\$5,107,000**Hybrid Renewable Energy Systems**

Over 300 remote communities in Canada are not connected to power grids or to gas pipelines. Most rely mainly on high-cost diesel fuel for their power. This project will demonstrate Renewable Microgrid Systems (RMS) that will enable remote communities to achieve a high penetration of renewable energy sources. The RMS applications will include local and supervisory controls, protection, coordinated power generation, energy storage and load management. An electrolyzer to produce hydrogen, hydrogen storage system, power generation via fuel cells and energy storage system are the components to be integrated and incorporated in a microgrid demonstration proposed for Bella Coola, BC.

Consortium Members

General Electric Canada Inc.
BC Hydro
VRB Power
General Electric Network Reliability Products and Services
Powertech Labs

Hillsborough Resources Ltd.**Round 9-2006A****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**

Total Project Value:

\$2,632,350

SDTC Funding:

\$868,676

Leveraged Funding:

\$1,763,674**Kaolin Production from Coal Mine Tailings**

This project will demonstrate a process to separate the kaolin and residual coal from the tailings stream at coal mines and produce a calcined pozzolan (primarily metakaolin) concrete admixture product at lower cost than currently imported material. Metakaolin can replace up to 15 per cent of Portland Cement, the latter's production being a significant source of CO₂ emissions. Metakaolin is one of the best supplementary cementitious materials (SCM) owing to its strength and long-term chemicals resistance. The proposed project consists of a 500 tonne per month demonstration plant to be located in Campbell River, BC.

Consortium Members

Hillsborough Resources Ltd.
Solution Ciment Ltd.
Levelton Engineering Ltd.
Northwest Pozzolan Ltd.

Industrial Catalytic Technologies Inc.**Round 9-2006A****Environmental benefits: Climate change / Clean air / Clean water**

Total Project Value:

\$2,513,016

SDTC Funding:

\$829,295

Leveraged Funding:

\$1,683,721**Catalytic Management of Polysulphide Pulp Production**

ICT will demonstrate kraft/polysulphide pulp production in two pilot plant projects. The first project will demonstrate ICT's continuous production process for making novel polysulphide pulping liquor. By replacing kraft-pulping liquor with continuously produced polysulphide liquor, along with improved pulping technology, the system produces a higher quality pulp; produces less volatile sulphides; and uses less energy and water. The second pilot project will use a catalytic process to remove volatile sulphur compounds and terpenes from pulp-making water. The process dramatically reduces energy use, water consumption and water treatment costs at pulp mills.

Consortium Members

Industrial Catalytic Technologies Inc.
Alberta Research Council Inc.
Eurocan Pulp & Paper Co.
Catatron Consortium Ltd.
DE Twoson & Associates Inc.
CETAC-West
Connection and Entrepreneurial Services Ltd.

Magenn Power Inc.**Round 9-2006A****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$2,810,300

SDTC Funding:
\$949,839

Leveraged Funding:
\$1,860,461

Magenn Air Rotor Systems (MARS)

Magenn Air Rotor Systems (MARS) are tethered “floating generators” that rotate in response to wind. The mechanical energy is converted into electrical power by generators attached at both ends of the horizontal axis, and transferred down the tether for use on the ground. Helium sustains the Air Rotor, which is placed in the strongest winds, usually between 200 and 1000 feet above ground level. MARS is projected to achieve reduced infrastructure and installation costs compared to current conventional wind turbine technology.

Consortium Members

Magenn Power Inc.
Mobile Airships
CarteNav Solutions
Donald J. Ross Enterprise Ltd.
Torsion Tec
Hissarlik Design
Permax Management Inc.
National Research Council
Conestoga-Rovers & Associates Ltd.
University of New Brunswick
University of Québec à Rimouski

Milligan Bio-Tech Inc.**Round 9-2006A****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$28,017,972

SDTC Funding:
\$7,004,493

Leveraged Funding:
\$21,013,479

System for the Valorization of Distressed Seeds

Milligan Bio-Tech and its partners are launching the first hub and spoke demonstration project for the valorization of distressed oil seeds. Technologies such as canola meal valorization, augmented crushing and a more efficient biodiesel production technology will be integrated in a system of spokes (crushing sites) and hubs (biodiesel plant and meal plant) across the Prairies. The project aims to effectively use resources and replace conventional fuels, in this case diesel. The transportation companies will test various concentrations of biodiesel created from a range of distressed oil-seed feedstocks.

Consortium Members

Milligan Bio-Tech Inc.
MCN BioProducts Inc.
Saskatchewan Transportation Company (STC)
Agriculture and Agri-Food Canada
Associated Engineering
University of Saskatchewan
City of Saskatoon Transit Fleet

MinMiner Technologies Ltd.**Round 9-2006A****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**

Total Project Value:
\$3,489,094

SDTC Funding:
\$1,151,401

Leveraged Funding:
\$2,337,693

Residual Hydrocarbons Recovery Using Solvent Coated Beads

MinMiner has acquired the Conrad Johnson Process (CJP) rights and enhanced the technology which recovers residual hydrocarbons from oil sand tailings through the use of solvent coated polyethylene beads. The technology will significantly reduce land and water use and can positively impact on key sustainability issues associated with oil sands development. The project will demonstrate the efficacy of CJP in a portable trailer mounted unit designed to handle 325 barrels of tailings per day. This phase could be followed by an in-situ demonstration plant designed to process 65,000 barrels of tailings per day.

Consortium Members

MinMiner Technologies Ltd.
Suncor Energy Inc.
WorleyParsons MEG
Canadian Environmental Advancement Corporation West
Kenaco Capital Services Inc.

RenewABILITY Energy Inc.**Round 9-2006A****Environmental benefits: Climate change / Clean air / Clean water**

Total Project Value:
\$3,553,000

SDTC Funding:
\$1,172,000

Leveraged Funding:
\$2,381,000

Effluent Heat Recovery Demonstration for the Pulp and Paper Industry

This project will demonstrate the economic, environmental and technological viability of the Power-Pipe™ Drain-water Heat Recovery system in corrosive pulp and paper mill settings. The Power-Pipe™ system reclaims waste energy from warm or hot effluent water using it to pre-heat incoming freshwater. The system involves reclaiming up to 85 per cent of waste energy from the effluent that is discharged from mills. Installing the Power-Pipe™ in 90 mills could reduce greenhouse gas emissions by over 1500 kilotonnes per year. Power-Pipe™ systems are currently installed in residential, commercial, and industrial applications in Canada and internationally.

Consortium Members

RenewABILITY Energy Inc.
Abitibi-Consolidated Inc.
Heresite Protective Coatings Inc.

Advanced BioRefinery Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**

Total Project Value:
\$3,598,450

SDTC Funding:
\$1,172,969

Leveraged Funding:
\$2,425,481

Cost-effective Modular Systems for Conversion of Forest Biomass to Value-Added Bio-Liquid

Advanced BioRefinery Incorporated (ABRI) and its consortium partners will demonstrate a 50 tonne-per-day, transportable fast pyrolysis system that converts logging residue including slash and bark into an energy-dense, economically transportable bio-liquid. The system is primarily designed for remote logging sites but has applications anywhere sufficient biomass exists. The liquid fuel will be used as a replacement for fossil fuel in industrial boilers and furnaces. The renewable fuel can also be used to generate electricity via a gas turbine. ABRI will field test the equipment, determine operating costs and establish relationships between feedstock qualities, product energy and chemical values.

Consortium Members

Advanced BioRefinery Inc.
St. Marys Paper Ltd.
Tembec Inc.
Orenda Aerospace Corporation
Ontario Ministry of Natural Resources
NRCan (CANMET Energy Technology Centre)

ARISE Technologies Corp.**Round 8-2005B****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$19,800,000

SDTC Funding:
\$6,500,000

Leveraged Funding:
\$13,300,000

Silicon Feedstock Pilot Plant Project

ARISE Technologies Corporation and its consortium partners will develop and demonstrate a new approach to refining high purity solar grade silicon feedstock for photovoltaic (PV) applications. A major constraint in the PV value chain has been the supply of silicon. The ARISE approach will use a new technique that produces silicon feedstock that can be fed into the ingot-making process that produces crystalline silicon ingots for solar cells. The approach will also allow for the recovery and reuse of waste silicon, significantly reducing costs. The silicon produced will meet the specifications of high-efficiency solar PV cell manufacturers.

Consortium Members

ARISE Technologies Corp.
Ebner Gesellschaft M.B.H.
Komag Inc.
Topsil Semiconductor Materials A/S
University of Toronto
University of Waterloo

Bio Vision Technology Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$9,398,237

SDTC Funding:
\$3,000,000

Leveraged Funding:
\$6,398,237

Biofuel Production from Biomass

Bio Vision Technology Inc. will demonstrate a unique biofuel pilot plant that converts renewable biomass (plant material) into feedstocks that can be processed into fuel ethanol and other value-added, co-generated chemical commodities. Until now, engineering and economic challenges have made it unfeasible to convert woody plant fibres (lignocellulose) into industrially useable sugars on a commercially viable basis. Bio Vision has developed an integrated system with a thermal reactor that uses steam fractionation to hydrolyze lignocellulose. Downstream processes convert the output into marketable products such as fuel ethanol, lignin, furfural and acetic acid. Value-added products such as biodegradable plastics, building materials, specialty chemicals, cosmetics, lubricants, paints, herbicides, and fertilizers can also be produced from the feedstocks. Bio Vision's small scale technology minimizes feedstock transportation costs and makes valuable commodity production possible in rural regions with smaller waste volumes.

Consortium Members

Bio Vision Technology Inc.
Coles Associates Ltd.

Bystronic Solution Centre Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$5,932,500

SDTC Funding:
\$2,000,000

Leveraged Funding:
\$3,932,500

Fenestration System Technology

Bystronic Solution Centre is demonstrating a new technique of window fabrication that reduces the energy used in manufacturing, saves material and labour costs, and allows for designs that reduce heat loss by as much as half. These savings are achieved through the use of "Friction Corner Welding" to weld PVC frames around insulating glass units, in combination with new frame and glass assembly techniques. The resulting enhanced structural performance enables the fabrication of heavier triple-glazed windows without increased frame costs, as well as reduced energy utilization and costs to manufacture double-glazed windows. The techniques can be applied to other plastics fabrication industries allowing for the development of new energy efficient products. Bystronic's technology will be demonstrated by its consortium partners, Farley Windows and Montreal PVC Plastics.

Consortium Members

Bystronic Solution Centre Inc.
Bystronic Maschinen AG
Farley Windows
Montreal PVC Plastics

Cerestech Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean water**

Total Project Value:
\$7,750,533

SDTC Funding:
\$2,500,000

Leveraged Funding:
\$5,250,533

Thermoplastic Starch (TPS) Blend Process Scale-up

Cerestech Inc. has a project that involves the full scale, pre-commercial demonstration of an innovative technology that substitutes up to half of synthetic plastic resins with bio-based thermoplastic starch (TPS) in the manufacturing of products such as films, bags and injection-moulded goods. TPS, made from starch and glycerol (a biodiesel production residue), is an inexpensive substance that comes from renewable resources. The process allows for the creation of blends that have similar properties to pure synthetic resin including recycled plastics, but at a lower cost, using less water and heat, and with considerably less depletion of non-renewable resources.

Consortium Members

Cerestech Inc.
Pitt Plastics - Innovative Compounding Solutions
GSC Technology Inc.
Leistritz Corporation
IPL Inc.

Chinook Mobile Heating & Deicing Corporation**Round 8-2005B****Environmental benefits: Clean water / Climate change / Clean soil**Total Project Value:
\$5,419,375SDTC Funding:
\$1,806,457Leveraged Funding:
\$3,612,918**Tempered Steam Technology for Aircraft Defrosting & Deicing**

Chinook Mobile Heating and De-icing Inc. and its consortium partners will demonstrate an innovative aircraft deicing technology that will significantly reduce the environmental, economic and health costs of deicing compared with current methods employing glycol. The consortium's "Tempered Steam Technology" (TST) uses heated, steam-infused air to melt ice on aircraft surfaces, then heated air alone for drying. The technique can be performed at the gate, thereby reducing aircraft fuel usage incurred during live, engine-on deicing operations while providing operational cost savings to airport operators. The process lowers greenhouse gas emissions from engine idling and from the oxidation of unrecovered glycol. Currently, more than 20 million litres of glycol-based fluids are used annually in Canadian de-icing operations.

Consortium Members

Chinook Mobile Heating & Deicing Corporation
Hovey Manufacturing

EcoVu Analytics**Round 8-2005B****Environmental benefits: Clean water**Total Project Value:
\$2,388,712SDTC Funding:
\$788,275Leveraged Funding:
\$1,600,437**Ultra-Trace Level Water Contaminant Concentrator**

EcoVu Analytics Inc. will demonstrate an improved water quality monitoring system utilizing a technology that concentrates contaminants in the monitoring device. The patented concentration process allows for timely, more efficient and reliable detection thereby optimizing the measurement of low-level microbiological and chemical pollutants. The technology is initially targeting voluntary testing for health and safety applications (drinking water treatment plants, in-field surface water sampling, and laboratory analysis). EcoVu's near real-time analysis results can enable water treatment plants to optimize plant operations and reduce chlorine use. In addition to monitoring, EcoVu can also apply the same technology to the remediation of high-value process waters such as heavy water used in the nuclear industry.

Consortium Members

EcoVu Analytics
Ontario Ministry of the Environment
The City of Ottawa
Quinte Conservation Authority
GAP EnviroMicrobial Services
Carleton University
HRose Machining Ltd.
Laser Diagnostic Instruments International Inc.

Ferti-Val Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean water / Clean soil**Total Project Value:
\$5,636,816SDTC Funding:
\$1,860,149Leveraged Funding:
\$3,776,667**Demonstration of the Valoris™ Sludge Treatment System**

Ferti-Val Inc. and its partners plan to create fuel by drying municipal bio-solid sludge from wastewater treatment into solids, applying and tailoring an existing European sludge drying technology called Valoris™. The system boils off the water and captures the heat from the water vapour for reuse, and converts the sludge into treated, high-value components such as fuel. The solution will also reduce greenhouse gases released from landfills and helps conserve both landfill space and water. Unlike many other biomass drying projects in development today which target agricultural, pulp and paper or wood waste, this consortium is focused on the municipal waste sector.

Consortium Members

Ferti-Val Inc.
Mechtronix Systems Inc. (MSI)
Ville de Granby

Green Canal Holdings Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$4,343,000

SDTC Funding:

\$1,448,000

Leveraged Funding:

\$2,895,000**Mines Emissions Reductions Initiative**

Green Canal Holdings Inc. will develop and demonstrate a new ventilation technology, “Dynamic Ventilation on Demand” (DVOD), which provides an automated deep mine ventilation control system. If successful, the technology will lead to significant energy savings as well as climate change and clean air benefits in the mining industry.

Consortium Members

Green Canal Holdings Inc.
Delta RCS AS
INCO Limited
Falconbridge Limited
Flairbase Inc.
Energy Reaction Inc.

Hydrogenics Corp.**Round 8-2005B****Environmental benefits: Clean air / Climate change**

Total Project Value:

\$16,281,106

SDTC Funding:

\$5,372,765

Leveraged Funding:

\$10,908,341**Fuel Cell-Powered Forklift Project (Phase 2)**

Hydrogenics Corporation, General Motors of Canada and NACCO Materials Handling Group have partnered to continue their work in the commercialization of fuel cell technology for the material handling industry. The consortium proposes to deploy 19 lift trucks and tuggers outfitted with fuel cell power packs for 24 months at GM’s Oshawa assembly plant. This deployment represents one of the largest and longest-running fuel cell-powered material handling deployments in the world and is a critical step toward commercialization in this market.

Consortium Members

Hydrogenics Corp.
General Motors of Canada Limited
NACCO Materials Handling Group Inc.

Maritime Innovation**Round 8-2005B****Environmental benefits: Clean water**

Total Project Value:

\$2,952,380

SDTC Funding:

\$979,800

Leveraged Funding:

\$1,972,580**No Invasive Species On-Board (NISOB) Project**

Maritime Innovation with the “No Invasive Species Onboard Project” (NISOB) aims to contribute to the preservation of the biological integrity and quality of Canadian waters by reducing the risk of introducing aquatic invasive species through the water and sediments carried by commercial vessels in their ballast tanks. NISOB is a ballast water technology demonstration program that proposes to enhance two treatment technologies (biological de-oxygenation and chemical treatment) and to develop a new application for a filtration unit that could be used as a pre-treatment for ships’ ballast water and sediments.

Consortium Members

Maritime Innovation
Degussa Canada Inc.
Fisheries and Oceans Canada's
Maurice Lamontagne Institute
Institut des Sciences de la mer
Institut Maritime du Québec
Kinetrics Inc.
Marine Biotechnology Research
Centre
Maritime Innovation
MD Technologies Ltd.
Université de Québec à Rimouski

MCW Consultants Ltd.**Round 8-2005B****Environmental benefits: Climate change / Clean air / Clean water**

Total Project Value:
\$6,037,000

SDTC Funding:
\$2,000,000

Leveraged Funding:
\$4,037,000

Sir Sanford Fleming/Baycrest School - Turning Urban Public Assets into Embedded Energy Generation Assets

MCW Consultants Ltd. and the Toronto District School Board seek to streamline the process for renewable energy technology installations. The project involves the development of standardized documentation and processes used in the design, construction, tendering, approval and installation of photovoltaic (PV) and wind power installations, in order to reduce transaction costs associated with installation. Up to two-thirds of the installed cost of current PV systems can be attributed to these “transaction costs” to design, approve and install the systems in a building. The improved processes could be used in the renewal of Toronto public schools and for other school facilities across Canada.

Consortium Members

MCW Consultants Ltd.
Diamond and Schmitt Architects
Toronto District School Board

New Energy Corporation Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$6,000,000

SDTC Funding:
\$2,000,000

Leveraged Funding:
\$4,000,000

Tidal Power Generation

New Energy Corporation Inc. and its partners have teamed together to demonstrate tidal power generation on British Columbia’s west coast. The project consists of installing 2x250 kW vertical axis tidal current turbines in a narrow channel between Maude Island and Quadra Island, adjacent to Seymour Narrows, near Campbell River, BC. The technology to be demonstrated is New Energy’s EnCurrent vertical axis turbine which employs vanes mounted parallel to a vertical shaft to extract energy from a moving stream of water regardless of its direction.

Consortium Members

New Energy Corporation Inc.
Canoe Pass Tidal Energy Corporation
Focus Environmental, Inc.

Nutriloc Ingredients Corp.**Round 8-2005B****Environmental benefits: Climate change / Clean air / Clean soil**

Total Project Value:
\$1,736,772

SDTC Funding:
\$450,851

Leveraged Funding:
\$1,285,921

Nutriloc Modular Microwave Vacuum Drying Unit

Nutriloc Ingredients Corp. and its consortium partners will demonstrate a technology to dehydrate fruits, vegetables and other products with superior cost efficiency and quality compared with freeze drying - the current industry standard. The benefits of the Nutri-loc™ system include not only better dried products in terms of flavour, taste, colour and nutrient value but also lower energy use and reduced greenhouse gas emissions. Nutriloc is currently designing a portable drying unit that can be trucked to farms and food processing plants, eliminating transportation costs associated with hauling “wet” produce to a central factory.

Consortium Members

Nutriloc Ingredients Corp.
Sun Rich Fresh Foods Inc.

Ostara Nutrient Recovery Technologies Inc.**Round 8-2005B****Environmental benefits: Clean water / Climate change / Clean air / Clean soil**Total Project Value:
\$1,744,611SDTC Funding:
\$375,760Leveraged Funding:
\$1,368,851**Struvite Recovery Commercial Demonstration Scale Project**

Ostara Nutrient Recovery Technologies Inc. and its consortium are developing technologies to recover nutrients from liquid sewage and then produce environmentally safe, slow release fertilizer. In addition to reducing the amount of pollutants released into the environment, the solution also produces revenue from the sale of fertilizer. Ostara will demonstrate its technology at the City of Edmonton's Gold Bar Wastewater Treatment Plant, and test the purity and effectiveness of its fertilizer through the BC Ministry of Environment stream enrichment programs for Steelhead recovery.

Consortium Members

Ostara Nutrient Recovery Technologies Inc.
The City of Edmonton
British Columbia Ministry of Environment

Peacock Industries Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean water / Clean soil**Total Project Value:
\$3,987,000SDTC Funding:
\$1,248,126Leveraged Funding:
\$2,738,874**Reduction of Soil, Water and Air Contamination by Replacing Toxic Pesticides and Fertilizers with New Mustard Products: Bio-pesticides and Bio-diesel**

Peacock Industries Inc. and its consortium aim to produce an environmentally-friendly organic bio-pesticide and methyl ester (used to produce bio-diesel) from mustard seed. The bio-pesticide is made from food quality materials and is safe to both humans and the environment. The product is used to control nematodes and fungi, and will be sold also as a product to enhance plant growth and improve soil quality. The methyl ester used in bio-diesel production will help improve air quality, reduce mineral oil consumption and engine wear, and improve fuel mileage.

Consortium Members

Peacock Industries Inc.
Nematrol Inc.
Innovation Place Bio Processing Centre
Ag-West Bio Inc. (AWB)
Saskatchewan Mustard Development Commission (SMDC)
University of Saskatchewan
Bio-Green Technologies Inc.
Eastern Greenway Oils
Chemtura
Agriculture & Agri-Food Canada
POS Pilot Plant Corp.

Power Measurement Ltd.**Round 8-2005B****Environmental benefits: Climate change / Clean air / Clean water**Total Project Value:
\$7,575,000SDTC Funding:
\$2,500,000Leveraged Funding:
\$5,075,000**Enerprise Energy Management System**

Power Measurement Ltd. and its consortium will demonstrate systems consisting of advanced software and energy meters that help commercial and industrial energy consumers improve energy efficiency and reduce energy-related emissions. The "enterprise energy management" platform will provide accurate, real-time data on the consumption of electricity and piped utilities (including water, air, gas, and steam) as well as outflow monitoring for SO₂, NO_x and waste water. These systems will help companies actively manage their energy efficiency programs, monitor their adherence to ISO 14001 or other sustainability goals, and identify best practices. The information can also be used by energy providers to develop utility load management strategies.

Consortium Members

Power Measurement Ltd.
Brookfield Properties
Weyerhaeuser Company

Tantalus Systems Corp.**Round 8-2005B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$9,401,751

SDTC Funding:

\$2,981,310

Leveraged Funding:

\$6,420,441**Electricity Conservation and Demand Management**

Tantalus Systems Corp. will demonstrate combined technologies in advanced metering, wireless communication, and in-home displays to give consumers a real-time measure of their households' power consumption in units of dollars, carbon dioxide emissions, and/or kilowatt-hours. For the first time, consumers can be alerted whenever prices change or green energy is available as well as gain easy access to usage information needed to curb wasteful habits and save money. It also makes it possible for utilities to manage operations more efficiently, implement opt-in load control initiatives, and offer equitable dynamic pricing programs. By closing the communications loop, power reductions of up to 20 percent can be achieved.

Consortium Members

Tantalus Systems Corp.
Blue Line Innovations Inc.
Chatham-Kent Hydro Inc.
McMaster University

The Pressure Pipe Inspection Company**Round 8-2005B****Environmental benefits: Clean water / Clean soil**

Total Project Value:

\$1,235,000

SDTC Funding:

\$400,000

Leveraged Funding:

\$835,000**Robot Device for Pipe Inspection**

The Pressure Pipe Inspection Company Ltd. and its consortium will develop and demonstrate "PipeDiver," a robotic device that inspects small diameter, pre-stressed cylindrical concrete pipe (PCCP) used for water transportation. The device will enable the identification of distressed pipe, enabling water utilities to minimize operational risks, optimize their investment, and extend the safe and economic life of their pipelines – saving themselves, and taxpayers, millions of dollars. Canada's PCCP infrastructure is aging and starting to decay. While the risk of pipe failure is low, failures can be catastrophic. Such failures result in interruptions to the water supply as well as damage to adjacent pipes and infrastructure.

Consortium Members

The Pressure Pipe Inspection Company
C-Core
Halifax Regional Water Commission
Hyprescon
InvoDane Engineering Ltd.
Orvitek Inc.
Queen's University

TSC Company Ltd.**Round 8-2005B****Environmental benefits: Climate change / Clean water**

Total Project Value:

\$26,700,000

SDTC Funding:

\$5,000,000

Leveraged Funding:

\$21,700,000**Mobile Oil Sand Mining and Extraction Technology**

TSC Company Ltd. and Total Energy Canada will demonstrate a novel oil sands mining technology that will significantly increase the rate of bitumen recovery, reduce water usage from the Athabasca River system, reduce energy requirements and minimize the need for tailings ponds. The project involves constructing and operating a pilot plant to test TSC's bitumen extraction and tailings management systems, and prove the technology's effectiveness for use on a commercial scale.

Consortium Members

TSC Company Ltd.
Deer Creek Energy Limited

Unicell Ltd.**Round 8-2005B****Environmental benefits: Clean air / Climate change**

Total Project Value:
\$7,032,000

SDTC Funding:
\$2,110,000

Leveraged Funding:
\$4,922,000

Lightweight Electric Urban Delivery Vehicle

Unicell Ltd. and its consortium partners will demonstrate the environmental benefits and operational advantages of an all-electric, lightweight composite monocoque urban delivery vehicle in typical Canadian operating conditions. The demonstration involves putting a small fleet of the vehicles into commercial use with Purolator Courier in Toronto and other cities across the country. These vehicles will replace conventional gasoline-powered delivery vans, eliminating on-street emissions and reducing greenhouse gas emissions by more than 80 per cent. These vehicles will have twice the useful life of conventional vans, leading to further environmental and economic advantages. The project also seeks to demonstrate that couriers using the vehicle will be more productive in their route activities, leading to substantial savings for their operators.

Consortium Members

Unicell Ltd.
ArvinMeritor Inc.
Battery Engineering and Test Services, Inc.
Bodycote Material Testing
Electrovaya Inc.
PMG Technologies Inc.
Purolator Courier Ltd.
Southwestern Energy
Transportation Development Centre

Wind Smart Inc.**Round 8-2005B****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$4,300,000

SDTC Funding:
\$1,200,000

Leveraged Funding:
\$3,100,000

Hydrostatic Drive System for Wind Turbines

Wind Smart Inc. and its consortium are demonstrating a new drive system for wind turbines that will increase power generation compared with gear-driven assemblies, while reducing maintenance costs. Unlike conventional models, the motor and generator will be situated at ground level. The system will replace the gearbox presently employed on wind turbines with a hydraulic motor to drive a hydrostatic pump. This will drive a synchronous generator, which in turn will generate power directly into the electricity grid. The system will enable the capture of more wind energy over a wider wind speed range, using the same turbine. A key innovation is the ability to control the hydrostatic drive unit and to prevent over-speeding of the wind turbine. This application is designed for wind turbines up to 1.5 MW with standard off-the-shelf components.

Consortium Members

Wind Smart Inc.
Cavendish Investing Inc.
Denison Hydraulics/Parker Hannifin Canada Inc.
Allen R. Nelson Engineering Inc.
Jones Group Engineering Ltd.

AirScience Technologies Inc.**Round 7-2005A****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$3,248,000

SDTC Funding:
\$1,038,180

Leveraged Funding:
\$2,209,820

Hydrogen Production from Landfill Gas

AirScience Technologies Inc. is demonstrating a new process, Terragas, to economically produce hydrogen from biomass feedstocks such as landfill gas. The project will use two new process technologies under license from Unitel Technologies: one for cleaning landfill gas and the second to convert the clean gas to hydrogen and CO₂. The cleaning process will cost-effectively remove trace contaminants from biogas that would otherwise damage internal combustion engines, turbines or an auto-thermal reforming reactor, without having to dry the gas and/or remove oxygen and CO₂. By focusing on both the gas purification and conversion to hydrogen at a commercial scale, landfill operators can generate up to 6 times the economic value obtained by existing landfill-to-electricity approaches, while lowering the environmental impact of methane release from landfills.

Consortium Members

AirScience Technologies Inc.
Municipality of Dolbeau
SmartSoil Energy
University of Waterloo
Air Liquide Canada Inc.

Clear-Green Environmental Inc.**Round 7-2005A****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**Total Project Value:
\$9,505,504SDTC Funding:
\$2,300,000Leveraged Funding:
\$7,205,504**Advanced Bio-Processing and Co-Product Demonstration from Agriculture and Food Waste**

Clear-Green Environmental Inc. is demonstrating an innovative, three-stage process to treat dead stock and slaughter house waste that combines pretreatment, anaerobic digestion and nutrient recovery to generate renewable energy and valuable fertilizer. The technology will demonstrate the ability to extract valuable fertilizer nutrients from digested waste, replacing costly and energy-intensive production of conventional fertilizer. The goal is to eliminate waste storage and land-based disposal systems and allow for intensive livestock facilities to be located closer to cities and towns while eliminating concerns over water, air and soil contamination as well as odours.

Consortium Members

Clear-Green Environmental Inc.
Cudworth Pork Investors Group (CPIG) Inc.
Sinnett Pork Farm Ltd.
Ag West Bio Inc.
Saskatchewan Power Corporation
Agriculture and Agri-Food Canada
Saskatchewan Research Council
Prairie Agricultural Machinery Institute (PAMI)
University of Saskatchewan

Dépôt Rive-Nord inc.**Round 7-2005A****Environmental benefits: Climate change / Clean air**Total Project Value:
\$8,590,578SDTC Funding:
\$2,834,891Leveraged Funding:
\$5,755,687**Industrial Eco-complex for Multisource Energy Recovery with Gas Production**

Dépôt Rive-Nord Inc. is demonstrating an end-to-end treatment and transformation process which takes garbage from several sources including municipalities, agriculture, agri-food, and industrial, commercial and institutional (ICI) operations and converts it to pipeline-quality natural gas, recyclable paper and plastic, and organic fertilizers. By going direct-to-pipeline, Dépôt Rive-Nord is able to derive greater economic and environmental benefit from the produced gas.

Consortium Members

Dépôt Rive-Nord inc.
EBI Energie Inc.
EBI Environment Inc.
Gestion Environnementale Econord Inc.
Industries Machinex Inc.

EcoSmart Foundation Inc.**Round 7-2005A****Environmental benefits: Climate change / Clean air**Total Project Value:
\$5,165,728SDTC Funding:
\$1,721,909Leveraged Funding:
\$3,443,819**Supplementary Cementing Materials (SCM) Optimization System**

EcoSmart Foundation Inc. is demonstrating a system that will allow developers, architects, engineers, contractors and material suppliers to optimize the use of supplementary cementing materials (SCMs) by simulating the effects of varying the multitude of parameters that interplay on construction projects. By determining optimal SCM levels and tradeoffs, the system will enable users to reduce greenhouse gas emissions and construction costs, and lower the environmental footprint by directly reducing the amount of Portland cement required for construction projects.

Consortium Members

EcoSmart Foundation Inc.
Lafarge Canada
Yolles Partnership
University of New Brunswick
University of Calgary
Read Jones Christoffersen Ltd.
NRCan (CANMET - Materials Technology)
Greater Vancouver Regional District
Public Works and Government Services Canada
Halcrow Yolles

Envirogain Inc.**Round 7-2005A****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**

Total Project Value:

\$3,877,469

SDTC Funding:

\$1,221,403

Leveraged Funding:

\$2,656,066**Dried Organic Fertilizer Manufacturing**

Envirogain Inc. is demonstrating a fertilizer stabilizing and drying process that re-uses heat from existing hog manure treatment systems. This new, integrated approach converts a cost centre to a revenue centre by taking hog manure that would otherwise require treatment and disposal and converting it into saleable fertilizer, while also reducing emissions of greenhouse gases.

Consortium Members

Envirogain Inc.

F. Ménard Inc.

William Houde Ltée.

Maratek Environmental Inc.**Round 7-2005A****Environmental benefits: Clean air / Climate change / Clean water**

Total Project Value:

\$7,571,799

SDTC Funding:

\$1,900,000

Leveraged Funding:

\$5,671,799**Solvent Recovery from Shop Towels**

A consortium led by Maratek Environmental will build a world's-first demonstration project that will recover and reuse the solvent in soiled print shop towels, thereby eliminating an environmental liability, reducing disposal costs and creating a revenue stream from the recycled solvent. Maratek's process utilizes a volatile organic compound (VOC) removal system that removes over 95 percent of the used solvent from used shop towels and then recycles the towels. The process will incorporate a next-generation solvent distillation system that recovers most of the waste solvent for reuse and enhanced waste water treatment.

Consortium Members

Maratek Environmental Inc.

G&K Services Canada Inc.

Omega Recycling Technologies Inc.

FUJIFILM Hunt Chemicals U.S.A., Inc.

N-Solv Corp.**Round 7-2005A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$29,283,280

SDTC Funding:

\$8,604,672

Leveraged Funding:

\$20,678,608**Enhanced Solvent Extraction Process for Oil Sands**

N-Solv Corporation is demonstrating a 2,000-barrels-of-oil-per-day pilot plant to field test a patented process (N-Solv™) for in-situ extraction of bitumen from oil sands using a pure condensing solvent. The process offers commercially attractive production rates, a 90 percent reduction in energy costs, and an 80 percent reduction in greenhouse gas emissions when compared to conventional steam-based extraction processes. In addition, the process does not consume any water and produces an enhanced-quality oil product with higher value.

Consortium Members

N-Solv Corp.

Japan Canada Oil Sands Limited (JACOS)

Netistix Technologies Corp.**Round 7-2005A****Environmental benefits: Climate change / Clean air**Total Project Value:
\$1,388,441SDTC Funding:
\$540,554Leveraged Funding:
\$847,887**Netistix Emission Management System™ (NEMS)**

Netistix Technologies Corporation is demonstrating a low-cost vehicle monitoring and information system. It targets consumers who wish to reduce emissions, fuel, and lifecycle costs, while improving vehicle reliability and safety. The system analyzes both vehicle and driver behaviour data and provides reporting mechanisms to consumers on their driving history. The system will indicate real situations when driving behaviours are inefficient (such as long periods of idling that result in unnecessary fuel use), or when maintenance is required. By providing a feedback mechanism based on actual vehicle performance, users are able to adapt their behaviour in an environmentally and cost-advantageous way.

Consortium Members

Netistix Technologies Corp.
Petro Canada Certigard
Jacques Whitford
Carleton University
Automotive Industries Association of Canada
NRCan (Personal Vehicles Initiative)

Nexterra Energy Corp.**Round 7-2005A****Environmental benefits: Climate change / Clean air**Total Project Value:
\$8,357,575SDTC Funding:
\$2,758,263Leveraged Funding:
\$5,599,312**Lime Kiln Biomass Gasification Project**

Nexterra Energy Corp. is demonstrating a full-scale biomass (wood waste) gasification system that will be used to heat existing lime kilns in a conventional pulp mill. The direct firing of the synthetic gas will enable lime kilns to convert their energy source from fossil fuels to the gas produced from their own wood residue, thereby reducing energy costs as well as greenhouse gas emissions.

Consortium Members

Nexterra Energy Corp.
Pulp & Paper Research Institute of Canada (PAPRICAN)
Weyerhaeuser Company Ltd.
NRCan (Efficiency and Alternative Energy Program)
National Research Council - IRAP (Pacific)
Ethanol BC (Forintek Canada Corporation)

Outland Technologies Inc.**Round 7-2005A****Environmental benefits: Climate change / Clean air**Total Project Value:
\$6,000,000SDTC Funding:
\$2,000,000Leveraged Funding:
\$4,000,000**Power Generation from Waste Energy**

Outland Technologies Inc., in conjunction with its partners, will develop and demonstrate a new technology capable of generating electricity with reduced emissions using waste energy at gas pressure let-down sites (sites where natural gas pressure is deliberately reduced for processing or to facilitate safe distribution to customers). The “rotary positive displacement” (or CvR™) technology will provide significantly higher energy output compared with equally-sized conventional piston engines. While this technology is being applied at natural gas letdown stations, it has numerous follow-on applications including rotary positive displacement pumps and transportation engines.

Consortium Members

Outland Technologies Inc.
BP Canada Inc.
Single Buoy Moorings Inc.
Zed.i.solutions Inc.
L.O.P. Omnitech Inc.
Braeside Fabricators Inc.
Cojo Technology Inc.
Crimtech Services Inc.

Petroleum Technology Research Centre

Round 7-2005A

Environmental benefits: Climate change / Clean air

Total Project Value:

\$9,603,000

SDTC Funding:

\$3,168,990

Leveraged Funding:

\$6,434,010

Joint Implementation of Vapour Extraction

Petroleum Technology Research Centre is developing and demonstrating a simulation and analytical system that will facilitate the use of more environmentally sensitive and energy-efficient enhanced oil recovery (EOR) process for heavy oil reservoirs in western Canada. The technology uses a solvent vapour extraction process instead of steam to recover the heavy oil, thereby reducing both greenhouse gas emissions and fresh water use by over 90 percent compared with conventional processes. This technology is especially effective on wells that are partially depleted.

Consortium Members

Petroleum Technology Research Centre
Canadian Natural Resources Limited
Husky Energy Inc.
Nexen Petroleum Canada

Plasco Energy Group Inc.

Round 7-2005A

Environmental benefits: Climate change / Clean air / Clean water

Total Project Value:

\$21,350,000

SDTC Funding:

\$6,600,000

Leveraged Funding:

\$14,750,000

Plasma Gasification for Municipal Solid Waste (MSW)

Plasco Energy Group Inc. is demonstrating a Plasma Gasification process that will economically convert 75 tonnes a day of MSW into synthetic gas, inert solid material and heat. The heat and gas will be utilized in a power plant to produce electricity for sale into the electricity grid. By avoiding current disposal methods such as landfill or incineration, Plasco's new approach represents a breakthrough in both economic and environmental attractiveness.

Consortium Members

Plasco Energy Group Inc.
Hera Holdings S.L./Hera Plasco S.L.
City of Ottawa
Ontario Ministry of Research and Innovation

Power Diagnostic Technologies Ltd.

Round 7-2005A

Environmental benefits: Climate change / Clean air

Total Project Value:

\$5,200,000

SDTC Funding:

\$1,716,000

Leveraged Funding:

\$3,484,000

Methane Gas Detection and Imaging with Leak Calibration

Power Diagnostic Technologies Ltd. is demonstrating a portable leak detection technology to detect and quantify gas leaks in confined spaces such as refineries and natural gas processing plants. This tool will enable the petrochemical industry to find leaks more efficiently, accurately and cost-effectively than today's manual methods, and will provide a feature to calibrate the leak rates of fugitive emissions such as methane, to comply with environmental regulations.

Consortium Members

Power Diagnostic Technologies Ltd.
BP Canada Energy Company
BP Products North America Inc.
Controp Precision Technologies Ltd.
Semi Conductor Devices Inc.
Corona Vacuum Coaters Inc
Stereoscopic Image Systems Limited
Acura Embedded Systems Inc.
Public Works and Government Services Canada

SHEC LABS (Solar Hydrogen Energy Corporation)**Round 7-2005A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$6,230,000

SDTC Funding:

\$2,076,667

Leveraged Funding:

\$4,153,333**Application of Solar Energy for Hydrogen Generation**

SHEC Labs is demonstrating its breakthrough Direct Water Splitting (DWS) technology which converts ordinary water to hydrogen using only solar energy. Currently, energy-intensive steam reformation of fossil fuels is responsible for 95 percent of the world's hydrogen production. SHEC's new approach -- the world's first commercial-scale renewable solar hydrogen -- can be cost-competitive with steam methane reformation and can dramatically reduce greenhouse gas emissions and other air pollutants.

Consortium Members

SHEC LABS (Solar Hydrogen Energy Corporation)

Giffels Associates Limited (An Ingenium Group Company)

SaskEnergy Incorporated

Praxair

University of Toronto - Department of Chemical Engineering and Applied Chemistry

Bunge Canada

Clean 16 Environmental Technologies Corp.

Vaperma Inc.**Round 7-2005A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$13,228,594

SDTC Funding:

\$4,365,436

Leveraged Funding:

\$8,863,158**Biofuel Advanced Dehydration System Using Novel Vapor Permeation Membrane**

Vaperma Inc. is demonstrating a technology that will improve the efficiency and cost-effectiveness of ethanol production. Using an innovative polymer membrane to separate water vapour from ethanol fuel—normally a very energy-intensive process—Vaperma is able to lower the energy cost required to produce ethanol by up to 40 percent. Along with lower greenhouse gas emissions, modularity, flexibility, simple operation and low maintenance, the process is adaptable to existing and new ethanol production plants, making this a leveragable technology for Canada and the world.

Consortium Members

Vaperma Inc.

Commercial Alcohols Inc.

EnCana-EEIF

Angstrom Power Inc.**Round 6-2004B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$1,263,271

SDTC Funding:

\$444,436

Leveraged Funding:

\$818,835**Remote Field Hydrogen Fuel Cell System**

Angstrom is proposing to develop and demonstrate a complete hydrogen systems power solution to remote/off-grid field operations by integrating Angstrom's fuel cell and hydrogen storage technology into portable devices such as flashlights and hand held radios powered by their prototype micro fuel cell technology fuelled by hydrogen. By avoiding the use of the electrical grid, this technology is able to provide enhanced security and reliability while reducing greenhouse gas emissions. Angstrom's first demonstration will be in the life-saving operations of one of British Columbia's Search and Rescue operations.

Consortium Members

Angstrom Power Inc.

BOC Group

Powertech Labs Inc.

University of Victoria

Doctors at the BC Children's Hospital
City of Vancouver, Urban Search and Rescue, Canada Task Force 1

Vancouver International Airport Authority

Hydrogen Technology & Energy Corporation

Clean Current Power Systems Inc.**Round 6-2004B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$4,795,500

SDTC Funding:

\$1,582,000

Leveraged Funding:

\$3,213,500**Tidal Turbine Generator – 65kW Field Demonstration**

Clean Current is demonstrating Canada's first free-stream tidal power project, to be installed at a British Columbia Ecological Reserve located 10 nautical miles southwest of Victoria, BC. The project will enable the marine park to convert tidal stream energy to electric power – replacing power supplied to the island by two diesel generators–beginning in 2006. It will be the first sustained field testing of a new electricity-generating technology in this harsh marine environment–opening the doors to the vast tidal energy resources throughout Canada's coastlines.

Consortium Members

Clean Current Power Systems Inc.
EnCana Corporation
Amec Americas Ltd.
Amec Dynamic Structures Limited
Lester B. Pearson College of the Pacific
Ocean Works International
Powertech Labs Inc.
Triton Consultants Ltd.

Electrovaya Corp.**Round 6-2004B****Environmental benefits: Clean Air / Climate Change**

Total Project Value:

\$5,054,539

SDTC Funding:

\$1,667,998

Leveraged Funding:

\$3,386,541**Lithium Ion Superpolymer® Battery for Application in Zero-Emissions Commercial Fleet Vehicles**

Electrovaya Corp. is demonstrating its patented Lithium Ion SuperPolymer® battery system for zero-emission battery-operated electric vehicles in commercial fleet operations. Electrovaya's award-winning battery technology delivers the highest energy density of any battery technology on the market today, enabling electric and hybrid-electric vehicles to operate cleanly over a long range.

Consortium Members

Electrovaya Corp.
Unicell Limited
SouthWestern Energy Inc.
Halton Hills Hydro Inc.
Purolator Courier Limited

Encelium Technologies Inc.**Round 6-2004B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$8,665,000

SDTC Funding:

\$2,820,000

Leveraged Funding:

\$5,845,000**Advanced Lighting Control & Energy Management System**

Encelium Technologies Inc. is demonstrating an advanced lighting control and energy management technology that delivers optimum light levels to each workspace in a building, eliminating wasted energy. The system allows all occupants in a building to control their individual "environments" by using their desktop computers to control light levels in their workspace. These advances will allow for the aggregation and control of lighting loads across multiple buildings and remote management of these loads for the purpose of demand response. This will reduce overall energy consumption and shave peak demand, thereby easing pressure to build new power generation capacity in growing cities.

Consortium Members

Encelium Technologies Inc.
Toronto Hydro Energy Services Inc.
Energy Profiles Ltd.

Enerworks Inc.**Round 6-2004B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$7,489,100

SDTC Funding:

\$2,449,100

Leveraged Funding:

\$5,040,000**ThermUtility Renewable Energy Project**

Enerworks Inc. is demonstrating an advanced renewable energy system which integrates highly energy efficient solar water heating and geothermal space heating and cooling technologies. Heating, air conditioning and hot water account for over 80 percent of the energy consumed in North American households. As an initial demonstration, systems will be installed in homes at no upfront cost to the homeowner. The new business model removes the main barrier to market adoption – initial capital cost – and at the same time introduces innovative renewable energy generation for residential housing.

Consortium Members

Enerworks Inc.
Clean Energy Developments Corp.
Toronto Hydro Energy Services Inc.
Windfall Ecology Centre
The Quantum Leap Company Limited

General Electric Canada Inc.**Round 6-2004B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$24,100,000

SDTC Funding:

\$6,000,000

Leveraged Funding:

\$18,100,000**Next Generation Drive Trains for Large Capacity Wind Turbines**

General Electric Canada Inc. is demonstrating a highly advanced wind turbine drive train that reduces mechanical vibration in next-generation 3- and 4-megawatt systems. The technology will provide enhanced performance, increased reliability and higher power density—enabling Canada to leapfrog current state-of-the-art practices. This initiative will advance wind as a mainstream energy supply option with a competitive cost of energy.

Consortium Members

General Electric Canada Inc.
Ecole de technologie supérieure
McGill University
University of Western Ontario

Group IV Semiconductor Inc.**Round 6-2004B****Environmental benefits: Clean air / Climate change**

Total Project Value:

\$6,460,182

SDTC Funding:

\$2,145,000

Leveraged Funding:

\$4,315,182**Solid State Lighting that Replaces Conventional Light Bulbs Used for General Illumination**

Group IV Semiconductor Inc. is demonstrating a new breed of low cost, high efficiency silicon based solid-state lighting products. The project builds on a revolutionary silicon thin-film process that for the first time will enable solid-state lighting to reach the mass market. The benefits of solid-state lighting derive from a much higher efficiency than conventional light bulbs, reducing energy consumption by as much as 80 percent. Unlike compact fluorescent light bulbs, solid-state lighting is able to reproduce the full colour spectrum required by mainstream applications.

Consortium Members

Group IV Semiconductor Inc.
McMaster University, Faculty of Engineering
NRC (Canadian Photonics Fabrication Centre)
Carleton University, Faculty of Engineering

Parkland BioFibre Ltd.**Round 6-2004B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$11,130,000

SDTC Funding:

\$3,000,000

Leveraged Funding:

\$8,130,000**Industrial Hemp Fibre Pilot Processing Plant**

Parkland BioFibre is demonstrating a process that will utilize raw industrial hemp fibre to produce insulation and other products while reducing waste streams. Using this process to make products like hemp insulation, non-woven matting and animal bedding will eliminate the atmospheric emissions produced by the current practice of burning hemp plants after grain harvest. Hemp insulation will sequester carbon for extended periods when used in buildings. Furthermore, this approach avoids the massive amounts of energy currently used to produce conventional fiberglass insulation.

Consortium Members

Parkland BioFibre Ltd.
 Parkland Industrial Hemp Growers
 Coop
 Olds Agtech Industries Inc.
 North American Natural Fibers
 UKAL (Canada) Ltd.
 McMunn & Yates Building Supplies
 Plant Fibre Technology

Prairie Pulp and Paper Inc.**Round 6-2004B****Environmental benefits: Climate change / Clean air / Clean soil**

Total Project Value:

\$11,289,068

SDTC Funding:

\$3,400,000

Leveraged Funding:

\$7,889,068**Tree-Free Agricultural-Fibre Paper Mill**

Prairie Pulp & Paper Inc. is demonstrating the viability of producing high quality paper products, including computer printer, facsimile and photocopy paper made from 100 percent agricultural residues such as flax stock. Employing an innovative agricultural fibre pulping process, this project has the potential to reuse otherwise discarded (and often openly burned) agricultural residues, which will generate profit from waste for Manitoba farmers, and offset the environmental impacts (energy, deforestation and chemical solvents) associated with producing paper from trees.

Consortium Members

Prairie Pulp and Paper Inc.
 Manitoba Straw Producers Co-op Ltd.
 Unisource Canada Inc.
 Manitoba Association of Agricultural
 Societies Inc. (MAAS)
 Manitoba Rural Adaptation Council
 (MRAC)
 Provincial Government of Manitoba,
 SDIF Program

Pratt & Whitney Canada Corp.**Round 6-2004B****Environmental benefits: Clean air / Climate change**

Total Project Value:

\$17,045,000

SDTC Funding:

\$5,624,850

Leveraged Funding:

\$11,420,150**Low Emission Engine Technology for Air Transportation**

Pratt & Whitney is demonstrating an innovative, low-emission technology for gas turbine engines used in aviation. The technology has the potential to simultaneously deliver major reductions of NOx, CO₂, VOC and particulates, as well as reduced greenhouse gas emissions—a feat previously thought to be impossible in medium and small jet engines.

Consortium Members

Pratt & Whitney Canada Corp.
 National Research Council
 University of Toronto - Institute for
 Aerospace Studies
 Goodrich Corporation's Turbine Fuel
 Technologies Division
 Hamilton Sundstrand Corporation
 United Technologies Research Center
 INCO Ltd.

Science Applications International Corp. (SAIC Canada)

Round 6-2004B

Environmental benefits: Climate change / Clean air

Total Project Value:
\$6,989,556
SDTC Funding:
\$1,716,589
Leveraged Funding:
\$5,272,967

Underground Thermal Energy Storage (UTES)

SAIC Canada is demonstrating an innovative thermal underground energy storage, and would be the first one of its kind in North America utilizing underground thermal energy storage (UTES) technology integrated with a solar thermal energy application. The concept of UTES is simple: store the energy (cold or heat) underground when it is available and use it when the stored cold or heat is needed in the next season. By utilizing the energy contained in natural seasonal cycles, SAIC and its partners are able to dramatically offset the economic and environmental impacts associated with heating and cooling homes and commercial buildings.

Consortium Members

Science Applications International Corp. (SAIC Canada)
Town of Okotoks
ATCO Gas and Pipelines Ltd.
United Acquisition II Corp. (United Communities)
Sterling Homes Ltd.
NRCan (CANMET Energy Technology Centre – Ottawa)
Climate Change Central/Energy Solutions Alberta (Prov. Of Alberta)
Hurst Construction Management
Enermodal Engineering
IF Technology International

Sunarc of Canada Inc.

Round 6-2004B

Environmental benefits: Climate change / Clean air

Total Project Value:
\$1,511,091
SDTC Funding:
\$498,660
Leveraged Funding:
\$1,012,431

Removable Foam Insulation Systems for Greenhouses

Sunarc of Canada Inc. is demonstrating on-demand removable foam insulation systems for greenhouses and other solar-receptive buildings, reducing the use of fossil fuels for heating by up to 50 percent. The computer-controlled system mechanically generates and circulates foam through the wall and roof cavities, and automatically dissipates the foam when weather conditions warrant. Sunarc's technology, which can be installed in both new and existing greenhouses, will contribute to efficient and competitive horticulture--extending the growing season and avoiding expensive and environmentally-unfriendly trucking of products to consumers in northern climates.

Consortium Members

Sunarc of Canada Inc.
Les Industries Harnois Inc.
Agriculture and Agri-Food Canada, Greenhouse and Processing Crops Research Centre
Les Jardiniers du Chef
Pyramid Farms Ltd.
Cedarline Greenhouses

Terra Gaia Inc.

Round 6-2004B

Environmental benefits: Climate change / Clean air / Clean soil

Total Project Value:
\$32,500,000
SDTC Funding:
\$5,300,000
Leveraged Funding:
\$27,200,000

Re-use of Waste Streams from Steel Manufacturing

Terra Gaia Inc. is demonstrating a technology that eliminates two of the largest hazardous wastes produced by the steel industry: electric arc furnace dust and waste hydrochloric acid. Current disposal practices for these wastes result in a substantial cost to the industry, including significant environmental liabilities, energy consumption and greenhouse gas production. Terra Gaia's patented technology involves a low-pressure, low-temperature process which is cost-competitive, produces significantly less greenhouse gas emissions and provides additional revenue streams through the generation of saleable byproducts.

Consortium Members

Terra Gaia Inc.
Norambar (Stelco Inc.)
Bateman Engineering
Enpower Corp.

University of British Columbia

Round 6-2004B

Environmental benefits: Climate change / Clean air

Total Project Value:
\$7,098,914

SDTC Funding:
\$2,342,600

Leveraged Funding:
\$4,756,314

Advanced High Performance Building Envelope with Integrated Sustainable Energy Components

The University of British Columbia is demonstrating technology that will be installed in the Centre for Interactive Research on Sustainability (CIRS), which will be the world's first state-of-the-art building to achieve a targeted MNECB-86 performance standard. Using a combined set of sustainable technologies, including 90 kW of integrated photovoltaic panels, mechanized solar shading devices, mechanized light-shelves for day-lighting, and natural ventilation components including mechanized operable windows and other energy saving components, coupled with an extensive adaptive sensing, monitoring and controls system, this building will become a “living laboratory” and demonstration centre for environmentally sustainable building design, technologies and operation.

Consortium Members

University of British Columbia
Busby Perkins & Will Architects
Keen Engineering
British Columbia Institute of Technology - Technology Centre
Visionwall Corporation
Siemens Building Technologies Ltd.

Alternative Green Energy Systems Inc.

Round 5-2004A

Environmental benefits: Climate change / Clean air / Clean soil

Total Project Value:
\$1,789,393

SDTC Funding:
\$588,875

Leveraged Funding:
\$1,200,518

Thermix/KDS Biomass Combustion System

Alternative Green Energy Systems (AgES) is demonstrating a system which radically lowers the environmental and economic cost of dealing with biomass waste from industrial processes such as those employed by the pulp & paper industry. Using a novel technology, AgES is able to dry waste biomass (pulp & paper sludge, wood chips, livestock waste) – kinetically, without heat, and using less than half the energy of conventional drying systems—to a point where it can be used to generate electricity, heat and other valuable co-products such as the expensive whitening and glossing agents from recycled paper (kaolin and clay, respectively).

Consortium Members

Alternative Green Energy Systems Inc.
Flakeboard Company Ltd.
Thermix Combustion Systems Inc.
First American Scientific Corporation
Hydro-Québec CapiTech Inc.
University of Toronto, Forestry Department

Atlantic Hydrogen Inc.

Round 5-2004A

Environmental benefits: Climate change / Clean air

Total Project Value:
\$6,454,479

SDTC Funding:
\$2,000,000

Leveraged Funding:
\$4,454,479

CarbonSaver™: GHG-Free Methane-to-Hydrogen System Integration (CMHS)

Atlantic Hydrogen Inc.'s technology, the CarbonSaver™, will feed hydrogen-rich natural gas as fuel for internal combustion engines for automotive application or in power generation. At the same time, this innovation removes the carbon in solid form rather than return it to the atmosphere as carbon dioxide. The new technology being developed in this three-year project is expected to be of particular importance for its efficacy in distributed power and refueling applications linked to the existing natural gas distribution grid.

Consortium Members

Atlantic Hydrogen Inc.
Hydrogen Engine Center
PrecisionH2 Power Inc.
University of New Brunswick
Energy Reactions Inc. (McGill University)
Enbridge Canada

Atlantic Packaging Products Ltd.**Round 5-2004A****Environmental benefits: Climate change / Clean air / Clean soil**

Total Project Value:

\$8,836,717

SDTC Funding:

\$2,514,600

Leveraged Funding:

\$6,322,117**TORBED Paper Sludge Combustion reactor**

Atlantic Packaging is demonstrating a system which converts paper mill waste biomass to energy. The energy generated can be used to produce steam for the operation thereby reducing the paper mill's consumption of natural gas. This sustainable, integrated approach is environmentally beneficial, saves the company money, and assists the gas utility in their demand management efforts.

Consortium Members

Atlantic Packaging Products Ltd.
Torftech (Canada) Inc.

Dofasco Inc.**Round 5-2004A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$3,000,000

SDTC Funding:

\$1,000,000

Leveraged Funding:

\$2,000,000**Emission Reduction by Lightweight Vehicle Parts**

Dofasco Inc. is demonstrating a new, lightweight structural laminate with potential to dramatically improve fuel efficiency by reducing the weight of motor vehicles. As vehicles get larger and heavier (trucks and SUVs), cost and environmental impacts associated with the added fuel consumption grow. By decreasing the weight using Dofasco's breakthrough technologies, auto manufacturers are able to meet consumer demand in an environmentally-responsible fashion.

Consortium Members

Dofasco Inc.
General Motors of Canada Ltd.

Great Northern Power Corp.**Round 5-2004A****Environmental benefits: Climate Change / Clean Air**

Total Project Value:

\$6,988,114

SDTC Funding:

\$1,981,914

Leveraged Funding:

\$5,006,200**Biomass Energy Saving System (BESS)**

Great Northern Power Corp. will demonstrate a system for economically producing electricity and heat using wood waste. Wood processing plants are typically located in isolated areas—often requiring expensive and environmentally undesirable forms of electricity. The benefits are reduced greenhouse gas emissions in Canada, and substantial energy cost savings for wood-processing operations.

Consortium Members

Great Northern Power Corp.
Northland Greenery Ltd.
Powerhouse Engineering Inc.
Northland Forest Products Ltd.

M.A. Turbo/Engine Ltd.**Round 5-2004A****Environmental benefits: Clean air**

Total Project Value:

\$332,604

SDTC Funding:

\$152,844

Leveraged Funding:

\$179,760**(Completed)****Reduction of Diesel Engines Exhaust Gas Emissions by Water Injection**

M.A. Turbo/Engine Ltd. is demonstrating a water-injection system for diesel engines which is designed to achieve significant reductions of NOx and particulate emissions in this engine type, while simultaneously lowering fuel consumption. The project will demonstrate the technology in maritime port equipment such as yard tractors, fork lifts and gantry cranes. This new technology offers significant cost savings and environmental improvements in highly sensitive areas such as shipping ports.

Consortium Members

M.A. Turbo/Engine Ltd.
Neptune Bulk Terminals (Canada) Ltd.
Rival Technologies Inc.

QuestAir Technologies Inc.**Round 5-2004A****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$21,848,000

SDTC Funding:
\$3,890,000

Leveraged Funding:
\$17,958,000

Demonstration of QuestAir Fast-cycle PSA Technology for Large Gas Separation in a Refinery Application

QuestAir Technologies Inc. is demonstrating its Pressure Swing Adsorption (PSA) technology for recovering hydrogen on a very large scale from process streams in oil refineries. Large quantities of hydrogen are required to create fuels that meet the low sulphur environmental regulations. QuestAir believes that its compact, modular gas purification technology will allow oil refineries to economically recover and re-use waste hydrogen, reducing net hydrogen consumption and the cost and GHG emissions associated with its production.

Consortium Members

QuestAir Technologies Inc.
ExxonMobil Research and Engineering Company

Techint Goodfellow Technologies Inc.**Round 5-2004A****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$12,262,110

SDTC Funding:
\$3,678,633

Leveraged Funding:
\$8,583,477

Development and Demonstration of Goodfellow EFSOP™ Technology

Techint Goodfellow Technologies Inc. is demonstrating a full-scale version of their proprietary EFSOP™ (Expert Furnace System Optimization Process) system, which is capable of continuously measuring the composition of exhaust gases from the harsh steelmaking Electric Arc Furnace (EAF) environment. Managing these energy-intensive processes more accurately enables cost savings and higher environmental performance. The technology will be applied to three industries that have been identified as significant contributors to greenhouse gas generation in Canada: steelmaking, cement production, and thermal power generating stations.

Consortium Members

Techint Goodfellow Technologies Inc.
Unisearch Associates Inc.
University of Toronto
The Ontario Centre for Environmental Technology Advancement (OCETA)
Hamilton Steel Group Inc.
St. Mary's Cement Inc.

Xantrex Technology Inc.**Round 5-2004A****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$15,000,000

SDTC Funding:
\$5,000,000

Leveraged Funding:
\$10,000,000

Integrated Power Electronic Controls for Large Wind Turbines

Xantrex is demonstrating an innovative power inverter technology and state-of-the-art drive train for wind turbine manufacturers around the world. The integrated drive train system will work seamlessly with new wind turbines of the two-megawatt to three-megawatt class, reducing operating costs and boosting overall performance and efficiency. These turbines are expected to be introduced over the next few years, likely overtaking turbines of the 1.5 megawatt-class and further improving wind energy economies of scale, and enabling increased adoption of wind power generation, a renewable energy-generation technology that produces no direct greenhouse gases or other air pollution.

Consortium Members

Xantrex Technology Inc.
Loher GmbH
Winergy AG

BIOX Canada Ltd.

Round 4-2003B

Environmental benefits: Clean air / Climate change

Total Project Value:

\$34,504,071

SDTC Funding:

\$5,000,000

Leveraged Funding:

\$29,504,071

New Atmospheric Technology for Biodiesel Production

BIOX Canada Limited is demonstrating a technology to convert any seed oil, recycled cooking oils, and animal tallows and fats into biodiesel at atmospheric pressure and near-ambient temperatures. It can also convert oils and fats to biodiesel faster than competing processes, and avoids using valuable vegetable oils. BIOX believes these advantages will result in considerably lower production costs, making biodiesel competitive with petroleum diesel.

Consortium Members

BIOX Canada Ltd.
 Dynex Capital Limited Partnership
 Weatons Holdings Limited
 CS Investment Capital Limited
 Notae Investments Limited
 Cotyledon Capital Inc.
 Bi-Pro Marketing Limited
 BIOX Corporation
 FCC Ventures

DeCloet Greenhouses Manufacturing Ltd.

Round 4-2003B

Environmental benefits: Climate change

Total Project Value:

\$1,724,490

SDTC Funding:

\$569,082

Leveraged Funding:

\$1,155,408

Energy Efficient Greenhouse Design-Technologies for Saving Energy in Commercial Greenhouses

DeCloet Greenhouse Manufacturing Ltd. has developed a variety of technologies, including a novel removable foam insulation technique to reduce energy consumption in greenhouses by 50 to 75 per cent, with corresponding reductions in operating costs and greenhouse gas emissions. With this level of reduction in energy consumption, it becomes affordable for Canadian greenhouses to operate year-round—avoiding the importing of produce with the associated transportation emissions. Further, Canadians can enjoy fresh produce grown locally year-round. New greenhouse structural designs will include automatic removable foam insulation, heat recovery and storage systems, micro-turbine cogeneration, new energy management process controls, infra-red thermal film, energy curtains, and supplemental lighting system technologies.

Consortium Members

DeCloet Greenhouse Manufacturing Ltd.
 Enbridge Gas Distribution Inc.
 Union Gas
 Agricultural and Adaptation Council (CanAdapt program)
 CEA Technologies International
 Greenhouse Engineering
 Quist Engineering and Consulting
 Argus Control Systems Ltd.
 P.L. Light Systems Canada Inc.
 Elliott Energy Systems Inc.

Fifth Light Technology Ltd.**Round 4-2003B****Environmental benefits: Climate change**

Total Project Value:
\$9,200,000

SDTC Funding:
\$3,036,000

Leveraged Funding:
\$6,164,000

Microprocessor Based Dimmer Technology for Fluorescent Lights Driven by Magnetic Ballasts

Fifth Light Technologies Ltd. is demonstrating a technology which utilizes a unique, patented controller system that allows fluorescent lighting systems using magnetic ballasts to be dimmed. Approximately 80% of commercial lighting uses magnetic ballasts. Fifth Light's technology allows for the individual, automated control of each lighting fixture in a building, in step with lighting needs and the time of day. In addition to reduced energy consumption and related costs, the technology's benefits include reduced greenhouse gas emissions, an average payback of 2.5 years for installation costs, improved light quality through elimination of over-lighting, doubling the life of fluorescent bulbs and ballasts, and a reduction in maintenance and capital costs.

Consortium Members

Fifth Light Technology Ltd.
New Orbit Technologies Inc.
Toronto Hydro Energy Services Inc.
Lindsay Electronics
Great West Life Realty Advisors Inc.

Gradek Energy Inc.**Round 4-2003B****Environmental benefits: Climate change / Clean soil**

Total Project Value:
\$25,322,000

SDTC Funding:
\$5,000,000

Leveraged Funding:
\$20,322,000

Recovery of Bitumen and Naptha from Oil Tailing Streams & Tailing Ponds

Gradek Energy is demonstrating a process for separating bitumen from oilsands and from tailings streams and ponds. The process is based on re-usable organic polymer beads to which hydrocarbons adsorb and can be recovered at low temperatures. Current oilsands processes leave vast, environmentally hostile tailings streams and ponds which are estimated to contain millions of barrels of unrecovered bitumen.

Consortium Members

Gradek Energy Inc.
SNC-Lavalin
Syncrude Canada
University of Alberta

Lignol Innovations Corp.**Round 4-2003B****Environmental benefits: Clean air / Climate change**

Total Project Value:
\$5,021,990

SDTC Funding:
\$1,672,323

Leveraged Funding:
\$3,349,667

Lignol Biomass Conversion Technology

Lignol Innovations is demonstrating a biorefinery process that claims to effectively and economically convert cellulose-based biomass such as forest industry wastes into ethanol and other marketable chemical products—leaving virtually no leftover waste. This is a two-stage process starting with separating and extracting wood components from waste material using a proprietary Organosolv process. The remaining insoluble cellulose is then broken down into sugars, and an enzymatic and fermentation process converts these sugars to fuel-grade ethanol. This innovation provides a key solution in the need to produce ethanol from low-value feedstocks, while at the same time reducing the chemical industry's reliance on petroleum.

Consortium Members

Lignol Innovations Corp.
University of British Columbia, Faculty of Forestry
Forintek Canada Corp.
Gryphin Co. Inc.
Michael Ainsworth
West Fraser Timber Co. Ltd.
Suncor Energy Products Inc.
Zuellig Group North America
Bio-Gro Inc.

Nanox inc.**Round 4-2003B****Environmental benefits: Clean air**

Total Project Value:
\$4,463,248

SDTC Funding:
\$1,800,000

Leveraged Funding:
\$2,663,248

Nanox inc. Phase I: Diesel Oxidation Catalyst (DOC), Three-Way Catalyst (TWC) and Scale Up

This project involves the development and demonstration of a low-temperature catalyst powder that claims to significantly reduce the quantity of platinum group metals (PGMs) required as the coating on catalytic converters for the automotive industry. This new catalyst is capable of converting carbon monoxide, volatile organic compounds (VOCs) and methane from engine exhaust into water and carbon dioxide at lower temperatures than PGMs (which only catalyze pollutants when the converter is hot). In conventional PGM catalytic converters, there is a significant period between cold start-up and optimum temperature when little or no catalysis is taking place. During this period, the pollutants may be exhausted directly into the atmosphere.

Consortium Members

Nanox inc.
Université Laval
Pangaea Ventures
Business Development Bank of Canada
The Solidarity Fund QFL
Hydro-Québec CapiTech Inc.
Sovar s.e.c.
Government of Québec

NxtPhase T&D Corp.**Round 4-2003B****Environmental benefits: Climate change**

Total Project Value:
\$3,226,542

SDTC Funding:
\$986,220

Leveraged Funding:
\$2,240,322

Optical Voltage and Current Sensor Cost Reduction and Field Demonstration

NxtPhase T&D Corp is demonstrating optical current and voltage sensors to control and monitor large-scale electric power grids. It is expected that devices of this type will replace the environmentally harmful (SF6-filled) instrument transformers and circuit breakers currently in use. The optical sensors represent a safe and environmentally friendly solution, with superior performance resulting in enhanced reliability of the grid—reducing the probability of events such as the August 14, 2003 blackout in Ontario and the northern U.S.

Consortium Members

NxtPhase T&D Corp.
BC Transmission Corporation
Powertech Labs Inc.

Sacré-Davey Innovations Inc.**Round 4-2003B****Environmental benefits: Clean air / Climate change**

Total Project Value:
\$17,832,999

SDTC Funding:
\$5,879,000

Leveraged Funding:
\$11,953,999

Integrated Waste Hydrogen Utilization Project (IWHUP)

Sacré-Davey Innovations Inc. is demonstrating a hydrogen fuel refining, storage, distribution and infrastructure program—a critical component to maintaining Canada's leadership in the hydrogen economy. By capturing waste hydrogen which is being vented to the atmosphere every day by more than a dozen of Canada's sodium chlorate manufacturing plants, Sacré-Davey is able to put this waste to good use in power generation, heavy and light-duty hydrogen burning vehicles, and vehicle refueling technologies. Further, this program will assist in lowering the production and distribution cost of hydrogen—a critical step in overcoming the barrier to fuel cell vehicles.

Consortium Members

Sacré-Davey Innovations Inc.
Westport Research Inc.
Clean Energy Fuels Canada
Hydrogen Technology and Energy Corp.
Greater Vancouver Transit Authority
Nuvera Fuel Cells
Easy-Wash Inc.
Dynetek Industries Ltd.
Powertech Labs Inc.
QuestAir Technologies Inc.
NRCan (Canadian Transport Fuel Cells Alliance)
Hydrogen Early Adopters Fund
Sacré-Davey Engineering

Synodon Inc.**Round 4-2003B****Environmental benefits: Climate change**

Total Project Value:
\$2,623,788

SDTC Funding:
\$650,000

Leveraged Funding:
\$1,973,788

Development of realSens™ Technology for Remote Sensing of Natural Gas

Synodon is demonstrating a helicopter-mounted remote sensor capable of detecting leaks in natural gas pipelines. This detector, called realSens™, is based on remote sensing methods and instrumentation developed at the University of Toronto and currently in use on NASA's Terra satellite. Current detection methods involve operators "walking the line" and are primarily manual and labour intensive. This new technology will enable pipeline operators to increase their efficiency in leak repair, avoid costly losses and prevent leak-related explosions.

Consortium Members

Synodon Inc.
Airborne Energy Solutions Ltd.
TransCanada Pipelines Ltd.

Whitefox Technologies Canada Ltd.**Round 4-2003B****Environmental benefits: Climate change / Clean air**

Total Project Value:
\$6,553,070

SDTC Funding:
\$2,608,545

Leveraged Funding:
\$3,944,525

Efficient Production of Fuel Ethanol to Reduce GHG and CAC

Whitefox Technologies Canada Ltd.'s project will involve the development and demonstration of a membrane technology for dehydration which is believed to reduce the overall cost of ethanol production in any ethanol plant by up to 3.5 cents per litre. In current ethanol production, a grain-based feed is fermented, separated and distilled. Conventional approaches are unreliable and inefficient because they use molecular sieve beds or plate and frame membranes/filters for moisture removal. The Whitefox process is much less energy intensive and has higher reliability, resulting in lower GHG emissions and improved air quality.

Consortium Members

Whitefox Technologies Canada Ltd.
Virtual Materials Group Inc.
Golden Triangle Energy LLC

Blue-Zone Technologies Ltd.**Round 3-2003A****Environmental benefits: Climate change**

Total Project Value:
\$8,100,000

SDTC Funding:
\$2,700,000

Leveraged Funding:
\$5,400,000

Pre-Commercial Demonstration Project for the Capture, Reclamation and Purification of Halogenated Anesthetic Greenhouse Gases in Hospitals

Blue-Zone Technologies Ltd. is demonstrating a technology to capture, reclaim and purify halogenated inhalation anaesthetic gases which are used in hospital operating rooms, much of which escape during medical application. These are very aggressive greenhouse gases, and some have global warming potential up to 1,900 times that of carbon dioxide. Blue-Zone claims that its technology, broadly called Delta™, can capture and recycle all of the vented gases. The anaesthetic can be re-used ten to twenty times. This offers hospitals significant savings in their expenditures on anaesthetic gas while preventing harmful GHG emissions.

Consortium Members

Blue-Zone Technologies Ltd.
University Health Network
University of Toronto, Faculty of Medicine
Jayne Industries Inc.
Highland Equipment Limited
Canadian Centre for Pollution Prevention
Ontario Centre for Environment Technology Advancement (OCETA)
Bodycote Materials Testing Canada Inc.
SANI-FLO Welding Limited
GMP Engineering Ltd.

Cansolv Technologies Inc.**Round 3-2003A****Environmental benefits: Climate change**

Total Project Value:

\$4,562,000

SDTC Funding:

\$1,520,000

Leveraged Funding:

\$3,042,000**Demonstration of a CO₂ Capture Process from Flue Gas**

Cansolv Technologies is demonstrating a way to reduce the cost of capturing carbon dioxide that currently escapes to the atmosphere through flue gas emissions from industrial processes such as pulp and paper mills and power generating stations based on fossil fuel. While the removal of gases that pose immediate health hazards is well regulated, current solutions do not enable the next step of lowering the impact on climate change. Cansolv's solution enables this important next step.

Consortium Members

Cansolv Technologies Inc.

Enviro-Access Inc.

Pulp and Paper Research Institute of Canada

Air Liquide Canada

Abitibi Consolidated Inc.

Cellex Power Products Inc.**Round 3-2003A****Environmental benefits: Clean air**

Total Project Value:

\$9,026,000

SDTC Funding:

\$2,000,000

Leveraged Funding:

\$7,026,000**Fuel Cell Power Unit for Industrial Vehicles**

Cellex Power Products Inc. is developing and demonstrating hydrogen fuel cells to replace industrial lead acid batteries and internal combustion engines in Class 3 fork-lift trucks, also referred to as industrial rider pallet trucks. The customer base for Class 3 fork-lifts is large warehouse operations typically found in food distribution, general merchandising retailing, and third party logistics suppliers. The result will be superior performing fork-lift trucks that increase productivity, provide cost savings for customers and lower harmful air emissions. Fuel cell products have zero emissions and consequently significantly mitigate greenhouse gas emissions as well as harmful airborne contaminants.

Consortium Members

Cellex Power Products, Inc.

Fuel Cells Canada

Arpac Storage Systems Corporation

Hydrogenics Corp.**Round 3-2003A****Environmental benefits: Clean air**

Total Project Value:

\$3,545,182

SDTC Funding:

\$1,560,000

Leveraged Funding:

\$1,985,182**(Completed)****Integration and Demonstration of Fuel Cell Powered Material Handling Equipment**

Hydrogenics Corporation is demonstrating its fuel cell technology in the forklift industry—an early market with real business needs that are not being met with today's battery and propane-operated forklifts. In today's high-volume warehouses, the safe and efficient movement of product is paramount. Hydrogenics' solution—currently being demonstrated at General Motors and FedEx—helps these customers avoid inefficiencies and safety hazards associated with recharging batteries and managing power when lifting stock. Another technological challenge Hydrogenics hopes to overcome is to reduce refueling time—currently a major cost to warehouse operations.

Consortium Members

Hydrogenics Corp.

Deere and Company Inc.

Federal Express Canada Ltd.

General Motors of Canada Ltd.

NACCO Materials Handling Group Inc.

Natural Resources Canada-CTFCA

(Canadian Transport Fuel Cell Alliance)

Paradigm Environmental Technologies Inc.**Round 3-2003A****Environmental benefits: Climate change / Clean air / Clean water**

Total Project Value:

\$1,208,804

SDTC Funding:

\$250,000

Leveraged Funding:

\$958,804**(Completed)****MicroSludge™ Prototype Development Project**

Paradigm Environmental Technologies Inc. is demonstrating a novel technology for lowering the biosolids output from conventional wastewater treatment processes by 60%, increasing the waste conversion effectiveness 10-fold and producing electricity from the resultant methane gas. By efficiently pre-treating and breaking down biological wastewater sludge, municipalities can save a significant portion of their wastewater treatment operating budget.

Consortium Members

Paradigm Environmental Technologies Inc.

Chilliwack Waste Water Treatment

Powertech Labs Inc.

Natural Resources Canada (CANMET Energy Technology Centre)

CH2M HILL

National Research Council

Quantiam Technologies Inc.**Round 3-2003A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$9,768,313

SDTC Funding:

\$1,450,000

Leveraged Funding:

\$8,318,313**Catalyzed-Assisted Manufacture of Olefins and Hydrogen**

Quantiam Technologies has developed a surface catalyst coating for furnace coils inside olefin crackers used in the petrochemical industry, which dramatically reduces the significant energy and maintenance required. These crackers typically operate at about 1100 C and are very energy intensive. Quantiam's technology would allow lower operating temperatures (by 50–100 C) and is retrofittable to existing furnaces, thereby minimizing capital investment and providing a viable near-term solution.

Consortium Members

Quantium Technologies Inc.

NOVA Chemicals Corporation

NOVA Research & Technology Corporation

RailPower Technologies Corp.**Round 3-2003A****Environmental benefits: Clean air**

Total Project Value:

\$3,634,902

SDTC Funding:

\$1,473,032

Leveraged Funding:

\$2,161,870**Hybrid Switching Locomotive Demonstration Fleet**

RailPower Technologies Corp. is demonstrating an ultra-energy efficient switcher locomotive. Most railway switcher locomotives incorporate standard diesel-electric configurations which, because they are not built for the very demanding stop-go environment of the railway switching yard, tend to operate inefficiently and generate harmful air emissions such as particulates and NO_x. Railpower's prototypes are powered by custom designed batteries, which are kept at full charge by a computer-controlled, smokeless diesel generator.

Consortium Members

Railpower Technologies Corp.

Alstom Transport Service

Southern Railway of British Columbia Limited

Transport Canada-Freight Sustainable Demonstration Program

Saskatchewan Power Corp.

Round 3-2003A

Environmental benefits: Clean air

Total Project Value:
\$7,367,900

SDTC Funding:
\$1,782,900

Leveraged Funding:
\$5,585,000

Field Evaluation of Activated Carbon Injection to Control Mercury Emissions from Coal-Fired Power Plant

Saskatchewan Power Corporation is demonstrating an innovative scrubber technology that uses recyclable activated carbon to capture mercury emissions generated from low-rank coal fired power generating plants. High quantities of mercury that settle in our food system can lead to neurological and nervous system disorders. Currently, there is no commercially available technology for reducing mercury emissions beyond the current standard. SaskPower's leadership will enable the creation of higher standards for emissions control, while at the same time facilitating the removal of GHGs.

Consortium Members

Saskatchewan Power Corp.
Alstom Canada Ltd.
Luscar Ltd.
University of North Dakota
Environmental and Energy Research Centre (UND-EERC)
NRCan (CANMET Energy Technology Centre)

Enerkem Technologies Inc.

Round 2-2002B

Environmental benefits: Climate change / Clean air / Clean soil

Total Project Value:
\$2,253,418

SDTC Funding:
\$720,573

Leveraged Funding:
\$1,532,845

(Completed)

Valorization of Municipal Solid Residues via Sorting, Gasification and Conversion to Energy Products

Enerkem Technologies Inc. is demonstrating a complete technology platform for the production of alcohol biofuels derived from complex wastes, using municipal solid waste as the initial feedstock. These biofuels can be used to generate electricity from landfill waste or can be further refined to valuable liquid commodities such as ethanol and methanol.

Consortium Members

Enerkem Technologies Inc.
SOQUIP Énergie Inc.
Government of Québec
Enviro-access inc.
Université de Sherbrooke (Groupe de Recherche sur les Technologies et Procédés de Conversion)
Ville de Sherbrooke

Ensyn Technologies Inc.

Round 2-2002B

Environmental benefits: Climate change / Clean air

Total Project Value:
\$8,895,871

SDTC Funding:
\$2,000,000

Leveraged Funding:
\$6,895,871

Industrial Demonstration of the Ensyn RTP Bio-Refinery

Ensyn Technologies Inc. is demonstrating an industrial integrated biomass refinery concept which uses a Rapid Thermal Processing (RTP) process to produce biofuel and other valuable chemical products from what would otherwise be a waste source such as sawmill waste.

Consortium Members

Ensyn Technologies Inc.
Renfrew Industrial Commission
Opeongo Forest Service

Highmark Renewables Inc.**Round 2-2002B****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**

Total Project Value:

\$7,056,245

SDTC Funding:

\$1,000,000

Leveraged Funding:

\$6,056,245**(Completed)****Integrated Manure Utilization System (IMUS)**

Highmark Renewables Inc. is demonstrating an Integrated Manure Utilization System (IMUS) which assists large cattle feedlots in managing their manure waste. An anaerobic digestion system which utilizes cattle manure to produce energy, bio-based fertilizer and reusable water, this system avoids land-spreading of raw manure—where harmful e-coli bacteria can enter the water system—and generates valuable energy, bio-based fertilizer, and reusable water as a result.

Consortium Members

Highmark Renewables Inc.

NRCan – (TEAM)

Alberta Agriculture Food & Rural Development

Alberta Research Council

Alberta Agricultural Research Institute

Climate Change Central

CETAC - WEST

Federation of Canadian Municipalities (Green Municipal Investment Fund)

Greenhouse Gas Mitigation Program for Canadian Agriculture

University of Alberta

IBC Technologies Inc.**Round 2-2002B****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$960,000

SDTC Funding:

\$266,000

Leveraged Funding:

\$694,000**Enhancement and Pre-Commercialization of a Top Efficiency eKOCOMFORT® Combined Home Heating and Ventilating System**

IBC Technologies Inc. is demonstrating a new, high efficiency combined ventilation and space/water heating system. This product is significantly more energy-efficient than standard systems and represents a breakthrough for residential applications.

Consortium Members

IBC Technologies Inc.

Nutech Energy Systems Inc.

Dexon Canada Manufacturing Corporation

GSW Water Heating Company, a division of GSW Inc.

NRCanada (CANMET Energy Technology Centre)

Mechanical Systems 2000 Inc.

Mikro-Tek Inc.**Round 2-2002B****Environmental benefits: Climate change / Clean soil**

Total Project Value:

\$3,483,350

SDTC Funding:

\$500,400

Leveraged Funding:

\$2,982,950**(Completed)****Soil Carbon Sequestration Using Mycorrhizal Management Technologies in Agricultural Crop Reclamation Grasses)**

Mikro-Tek Inc. is demonstrating a technology which enables grasslands and forests which have been damaged by industrial development to be reclaimed. To promote growth on these lands, Mikro-Tek has harnessed a naturally occurring soil fungi called mycorrhizae and developed a method to inoculate seedlings and plant roots. The increased growth rates enable these plants to capture harmful climate change gases and assist gas pipeline and mining companies to cost-effectively reduce their environmental and social impact.

Consortium Members

Mikro-Tek Inc.

North Sun Nurseries Inc.

Woodrising Consulting Inc.

IBK Capital

TransCanada Pipelines Limited

Noranda Inc./ Falconbridge Limited

Radiant Technologies Inc.

Round 2-2002B

Environmental benefits: Climate change / Clean air

Total Project Value:

\$5,500,000

SDTC Funding:

\$1,000,000

Leveraged Funding:

\$4,500,000

Development and Pre-Commercial Demonstration of Cross-Cutting Technologies Based on Microwave Assisted Processes

Radiant Technologies Inc. is demonstrating a family of technologies that use microwave and high frequency energy to enable extraction of edible oils from canola and soya feed and recovery of waste oils, contaminants and fine chemicals. Unlike conventional approaches, which use harmful hexane solvents, Radiant is able to recover oils in an environmentally clean and low-cost fashion.

Consortium Members

Radiant Technologies Inc.
Bunge Canada
NORAM Engineering and Constructors Ltd.

University of New Brunswick

Round 2-2002B

Environmental benefits: Climate change / Clean air

Total Project Value:

\$622,200

SDTC Funding:

\$260,000

Leveraged Funding:

\$362,200

Development and Pre-Commercial Demonstration of Interconnection Technologies Based on Power Electric Converters for Wind and Small Hydro Distributed Power Generation

The University of New Brunswick is demonstrating high performance interconnection technologies based on power electronic inverters for small wind turbine and hydro-electric distributed power generation systems. This efficient inverter enables cost-effective distributed power generation for small locations such as local communities and industrial settings.

Consortium Members

University of New Brunswick
Custom Research Ltd.
Eoletech Inc.
NB Power Corp.
Village of Dorchester
Briggs & Little Woolen Mills Ltd.
Turbowinds Canada Inc.

West Lorne Bio-Oil Co-Generation Partnership

Round 2-2002B

Environmental benefits: Climate change / Clean air

Total Project Value:

\$12,215,947

SDTC Funding:

\$5,000,000

Leveraged Funding:

\$7,215,947

(Completed)

Erie Flooring Bio-Oil Co-Generation Plant

West Lorne Bio-Oil Co-Generation Partnership is demonstrating its combined fast pyrolysis technology called BioTherm for the production of liquid fuels (bio-oil) from forest and agricultural residues (ie. wood, bark and straw) which operates in an integrated platform with a 2.5 MW gas turbine developed specifically to run on bio-oil. Unlike fossil fuels, bio-oil is renewable, clean burning, low in emissions and is greenhouse gas neutral.

Consortium Members

West Lorne Bio-Oil Co-Generation Partnership
DynaMotive Energy Systems Corporation
Ontario Power Generation Inc.
Orenda - Division of Magellan Aerospace Corporation
UMA Engineering Ltd.
Erie Flooring and Wood Products

ZENON Environmental Inc.**Round 2-2002B****Environmental benefits: Climate change / Clean air / Clean water**

Total Project Value:

\$5,334,000

SDTC Funding:

\$1,760,000

Leveraged Funding:

\$3,574,000**Zeelung™ Process for Industrial Wastewater Treatment**

ZENON Environmental Inc. is demonstrating a new technology which will reduce the energy required to treat wastewater in municipal, industrial and private systems. ZENON's membrane-supported biofilm reactor eliminates air emissions from the aerated bio-reactor typical of most applications, and reduces the energy required to break down and process wastewater by efficiently directing oxygen to the microorganisms in the system. By lowering the energy requirements, wastewater operators are able to lower their energy bills and the associated environmental impacts. This also allows municipalities to process more wastewater without having to upgrade their treatment facilities—an important consideration for any growing community.

Consortium Members

Zenon Environmental Inc.
 Ryerson University, Department of Applied Chemical and Biological Sciences
 McMaster University
 Environmental Technology Advancement Directorate (ETAD)

Bio-Terre Systems Inc.**Round 1-2002A****Environmental benefits: Climate change / Clean air / Clean water / Clean soil**

Total Project Value:

\$2,305,000

SDTC Funding:

\$864,375

Leveraged Funding:

\$1,440,625**Low Temperature Anaerobic Digestion and Co-generation System for Hog Manure Management**

Bio-Terre Systems Inc. is demonstrating a complete process chain designed to produce energy from hog manure and to manage nutrients from intensive pig farming in a sustainable fashion. The process is designed to capture and treat methane gas and then convert it into usable energy in accordance with site specific energy demand—enabling hog farmers to be energy self-sufficient while at the same time enabling the reduction of costly environmental buffer zones around their operations.

Consortium Members

Bio-Terre Systems Inc.
 Ferme Famille St-Hilaire
 Enviro-Accès inc.
 Ferme Peloquin
 Hydro Québec
 Université de Sherbrooke, Groupe de Recherche sur les Technologies et Procédés de Conversion
 Agriculture and Agri-Food Canada

Carmanah Technologies Inc.**Round 1-2002A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$2,035,062

SDTC Funding:

\$466,167

Leveraged Funding:

\$1,568,895**Edge-lit LED Lighting Project**

Carmanah Technologies Inc. is demonstrating an adaptation of solar-powered LED technology to edge-lit lighting and signage, which will lead to the development of a more diverse and robust solar industry. This project is expected to enable solar-powered lighting to enter mainstream applications and provide enhanced safety and security to Canada's roads and public transit systems.

Consortium Members

Carmanah Technologies Inc.
 BC Hydro
 British Columbia Institute of Technology

(Completed)

CO₂ Solution Inc.**Round 1-2002A****Environmental benefits: Climate change**

Total Project Value:

\$5,881,558

SDTC Funding:

\$858,707

Leveraged Funding:

\$5,022,851**(Completed)****CO₂ Capture, Sequestration & Recycle**

CO₂ Solution Inc. is demonstrating a technology which can help Canada and the world deal with harmful carbon dioxide emissions from a variety of industrial processes. By employing a unique enzyme-based bioreactor that operates in an aqueous environment, this technology leverages mechanical and physical chemical principals, as well as the catalytic action of an enzyme, to capture and sequester CO₂ in the form of inert bicarbonate compounds. These compounds can then be reused in valuable products such as baking soda.

Consortium Members

CO₂ Solution Inc.
 Aluminum Association of Canada
 CIFM (Centre intégré de fonderie et de métallurgie)
 Elkem Metal Canada
 Fonderie industrielle Laforo inc.
 Ville de Quebec
 Place Bonaventure
 Federation of Canadian Municipalities
 (Green Municipal Investment Fund)

Mabarex Inc.**Round 1-2002A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$3,400,000

SDTC Funding:

\$1,190,000

Leveraged Funding:

\$2,210,000**Dry-Rex™**

Mabarex Inc. is demonstrating a two-step, integrated wet granular-drying process (Dry-Rex) that uses low vacuum, forced-air steam at temperatures above 5C as the main driving force to dry paper mill biomass at temperatures much lower than other processes. Paper mill waste is a significant liability that must be shipped wet for disposal. By providing a cost-effective drying technology, Mabarex is able to turn a waste product into a valuable energy source.

Consortium Members

Mabarex Inc.
 Kruger Inc.
 Enviro-Access Inc.
 EM Optimisation Inc.
 NRCan (CANMET Energy Technology Centre)

Nova Chemicals Corporation**Round 1-2002A****Environmental benefits: Climate change / Clean air**

Total Project Value:

\$1,408,081

SDTC Funding:

\$320,000

Leveraged Funding:

\$1,088,081**(Early Termination)****Development of Polymer Membrane for Olefin-Paraffin Separation**

A new membrane technology has been developed that represents a two-orders of magnitude improvement in olefin-paraffin separation efficiency over existing membrane technologies, reducing capital cost of equipment required for separation while minimizing energy consumption and contributing to a reduction in GHG emissions.

Consortium Members

NOVA Chemicals Corporation
 Alberta Research Council
 University of Waterloo

Suncor Energy Inc.**Round 1-2002A****Environmental benefits: Climate change**

Total Project Value:

\$8,391,371

SDTC Funding:

\$2,250,000

Leveraged Funding:

\$6,141,371**Carbon Sequestration and Enhanced Methane Production**

Suncor Energy Inc. is demonstrating carbon sequestration and enhanced methane production in a closed cycle pilot project designed to capture CO₂ emissions, inject and sequester these emissions into a local subsurface coal reservoir and produce enhanced volumes of coal bed methane as a result.

Consortium Members

Suncor Energy Inc.

Encana Inc.

MGV Energy Inc.

Alberta Energy Research Institute

TransCanada Pipelines Ltd.

Alberta Research Council

Enerplus Resources Corporation

Penn West Petroleum Ltd.

Air Liquide Canada Inc.

University of Calgary

NRCan (TEAM & PERD)

Westport Research Inc.**Round 1-2002A****Environmental benefits: Clean air**

Total Project Value:

\$3,115,376

SDTC Funding:

\$1,000,000

Leveraged Funding:

\$2,115,376**Demonstration of Use of Liquefied Natural Gas (LNG) and Westport Fuel Injector Technology in Heavy Duty Trucks**

Westport Research Inc. is demonstrating a novel fuel injector technology that will prove the economic viability of operating heavy-duty (Class 8) trucks in a line-haul application using liquefied natural gas as the primary fuel instead of pure diesel. By using LNG, truck operators will be able to meet the upcoming low-emissions standards without incurring significant post-treatment costs.

Consortium Members

Westport Research Inc.

Enbridge Gas Distribution Inc.

Challenger Motor Freight Inc.

(Completed)

SDTC Portfolio Project Approved Funding Summary

* Amounts are based on approved project values – contracting to be finalized.

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Lead Consortium Member	Approved SDTC Funding	% of Total Eligible Project Costs	Eligible Recipient Funding Contribution	% of Total Eligible Project Costs	Other Government Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefit Bolded)			
Round 9-2006A											
Biothermica Technologies Inc. *	\$ 2,543,937	33.0%	\$ 3,149,362	40.9%	\$ 2,007,290	26.1%	\$ 7,700,589	CC	CA		CS
CCR Technologies Ltd. *	\$ 1,190,420	31.9%	\$ 2,312,700	62.0%	\$ 228,600	6.1%	\$ 3,731,720	CC	CA		CS
Dynamic Systems Inc. *	\$ 4,258,800	28.0%	\$ 6,676,799	43.9%	\$ 4,259,800	28.0%	\$ 15,195,399	CC	CA		
E.I. du Pont Canada Company *	\$ 1,058,587	33.0%	\$ 2,149,253	67.0%	\$ -	0.0%	\$ 3,207,840	CC	CA		CS
Enerkem Technologies Inc. *	\$ 2,660,476	32.9%	\$ 3,511,685	43.4%	\$ 1,925,000	23.8%	\$ 8,097,161	CC	CA		
GE ZENON ULC *	\$ 2,316,556	33.0%	\$ 4,703,311	67.0%	\$ -	0.0%	\$ 7,019,867	CC		CW	
General Electric Canada Inc. *	\$ 2,553,000	33.3%	\$ 5,107,000	66.7%	\$ -	0.0%	\$ 7,660,000	CC	CA	CW	CS
Hillsborough Resources Ltd. *	\$ 868,676	33.0%	\$ 1,763,674	67.0%	\$ -	0.0%	\$ 2,632,350	CC	CA	CW	CS
Industrial Catalytic Technologies Inc. *	\$ 829,295	33.0%	\$ 1,583,721	63.0%	\$ 100,000	4.0%	\$ 2,513,016	CC	CA	CW	
Magenn Power Inc. *	\$ 949,839	33.8%	\$ 1,430,500	50.9%	\$ 429,961	15.3%	\$ 2,810,300	CC	CA		
Milligan Bio-Tech Inc. *	\$ 7,004,493	25.0%	\$ 19,871,207	70.9%	\$ 1,142,272	4.1%	\$ 28,017,972	CC	CA		
MinMiner Technologies Ltd. *	\$ 1,151,401	33.0%	\$ 2,337,693	67.0%	\$ -	0.0%	\$ 3,489,094	CC	CA	CW	CS
RenewABILITY Energy Inc. *	\$ 1,172,000	33.0%	\$ 1,381,000	38.9%	\$ 1,000,000	28.1%	\$ 3,553,000	CC	CA	CW	
Round 8-2005B											
Advanced Bio-Refinery Inc. *	\$ 1,172,969	32.6%	\$ 1,867,000	51.9%	\$ 558,481	15.5%	\$ 3,598,450	CC	CA	CW	CS
ARISE Technologies Corp. *	\$ 6,500,000	32.8%	\$ 13,300,000	67.2%	\$ -	0.0%	\$ 19,800,000	CC	CA		
Bio Vision Technology Inc. *	\$ 3,000,000	31.9%	\$ 3,398,237	36.2%	\$ 3,000,000	31.9%	\$ 9,398,237	CC	CA		
Bystronic Solution Centre Inc. *	\$ 2,000,000	33.7%	\$ 3,932,500	66.3%	\$ -	0.0%	\$ 5,932,500	CC	CA		
Cerestech Inc. *	\$ 2,500,000	32.3%	\$ 4,750,533	61.3%	\$ 500,000	6.5%	\$ 7,750,533	CC		CW	
Chinook Mobile Heating & Deicing Corporation *	\$ 1,806,457	33.3%	\$ 2,712,918	50.1%	\$ 900,000	16.6%	\$ 5,419,375	CC		CW	CS
EcoVu Analytics	\$ 788,275	33.0%	\$ 1,261,217	52.8%	\$ 339,220	14.2%	\$ 2,388,712			CW	
Ferti-Val inc. *	\$ 1,860,149	33.0%	\$ 3,192,917	56.6%	\$ 583,750	10.4%	\$ 5,636,816	CC		CW	CS
Green Canal Holdings Inc. *	\$ 1,448,000	33.3%	\$ 2,895,000	66.7%	\$ -	0.0%	\$ 4,343,000	CC	CA		
Hydrogenics Corp.	\$ 5,372,765	33.0%	\$ 10,908,341	67.0%	\$ -	0.0%	\$ 16,281,106	CC	CA		

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Lead Consortium Member	Approved SDTC Funding	% of Total Eligible Project Costs	Eligible Recipient Funding Contribution	% of Total Eligible Project Costs	Other Government Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefit Bolded)			
Maritime Innovation *	\$ 979,800	33.2%	\$ 1,684,880	57.1%	\$ 287,700	9.7%	\$ 2,952,380			CW	
MCW Consultants Ltd. *	\$ 2,000,000	33.1%	\$ 3,887,000	64.4%	\$ 150,000	2.5%	\$ 6,037,000	CC	CA	CW	
New Energy Corp. Inc. *	\$ 2,000,000	33.3%	\$ 2,000,000	33.3%	\$ 2,000,000	33.3%	\$ 6,000,000	CC	CA		
Nutriloc Ingredients Corp.	\$ 450,851	26.0%	\$ 859,828	49.5%	\$ 426,093	24.5%	\$ 1,736,772	CC	CA		CS
Ostara Nutrient Recovery Technologies Inc.	\$ 375,760	21.5%	\$ 682,959	39.1%	\$ 685,892	39.3%	\$ 1,744,611	CC	CA	CW	CS
Peacock Industries Inc. *	\$ 1,248,126	31.3%	\$ 2,738,874	68.7%	\$ -	0.0%	\$ 3,987,000	CC		CW	CS
Power Measurement Ltd. *	\$ 2,500,000	33.0%	\$ 5,075,000	67.0%	\$ -	0.0%	\$ 7,575,000	CC	CA	CW	
Tantalus Systems Corp. *	\$ 2,981,310	31.7%	\$ 6,024,131	64.1%	\$ 396,310	4.2%	\$ 9,401,751	CC	CA		
The Pressure Pipe Inspection Company *	\$ 400,000	32.4%	\$ 372,500	30.2%	\$ 462,500	37.4%	\$ 1,235,000			CW	CS
TSC Company Ltd. *	\$ 5,000,000	18.7%	\$ 21,700,000	81.3%	\$ -	0.0%	\$ 26,700,000	CC		CW	
Unicell Ltd. *	\$ 2,110,000	30.0%	\$ 4,822,000	68.6%	\$ 100,000	1.4%	\$ 7,032,000	CC	CA		
Wind Smart Inc. *	\$ 1,200,000	27.9%	\$ 3,100,000	72.1%	\$ -	0.0%	\$ 4,300,000	CC	CA		
Round 7-2005A											
AirScience Technologies Inc. *	\$ 1,038,180	32.0%	\$ 1,108,720	34.1%	\$ 1,101,100	33.9%	\$ 3,248,000	CC	CA		
Clear-Green Environmental Inc. *	\$ 2,300,000	24.2%	\$ 4,425,504	46.6%	\$ 2,780,000	29.2%	\$ 9,505,504	CC	CA	CW	CS
Dépôt Rive-Nord inc.	\$ 2,834,891	33.0%	\$ 5,755,687	67.0%	\$ -	0.0%	\$ 8,590,578	CC	CA		
EcoSmart Foundation Inc. *	\$ 1,721,909	33.3%	\$ 3,343,819	64.7%	\$ 100,000	1.9%	\$ 5,165,728	CC	CA		
Envirogain Inc.	\$ 1,221,403	31.5%	\$ 2,114,896	54.5%	\$ 541,170	14.0%	\$ 3,877,469	CC	CA	CW	CS
Maratek Environmental Inc.	\$ 1,900,000	25.1%	\$ 5,271,799	69.6%	\$ 400,000	5.3%	\$ 7,571,799	CC	CA	CW	
N-Solv Corp.	\$ 8,604,672	29.4%	\$ 20,678,608	70.6%	\$ -	0.0%	\$ 29,283,280	CC	CA		
Netistix Technologies Corp.	\$ 540,554	38.9%	\$ 592,887	42.7%	\$ 255,000	18.4%	\$ 1,388,441	CC	CA		
Nexterra Energy Corp.	\$ 2,758,263	33.0%	\$ 4,879,312	58.4%	\$ 720,000	8.6%	\$ 8,357,575	CC	CA		
Outland Technologies Inc. *	\$ 2,000,000	33.3%	\$ 2,813,500	46.9%	\$ 1,186,500	19.8%	\$ 6,000,000	CC	CA		
Petroleum Technology Research Centre *	\$ 3,168,990	33.0%	\$ 3,976,010	41.4%	\$ 2,458,000	25.6%	\$ 9,603,000	CC	CA		
Plasco Energy Group Inc.	\$ 6,600,000	30.9%	\$ 6,426,000	30.1%	\$ 8,324,000	39.0%	\$ 21,350,000	CC	CA	CW	
Power Diagnostic Technologies Ltd. *	\$ 1,716,000	33.0%	\$ 3,148,000	60.5%	\$ 336,000	6.5%	\$ 5,200,000	CC	CA		

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SHEC LABS * (Solar Hydrogen Energy Corporation)	\$ 2,076,667	33.3%	\$ 4,153,333	66.7%	\$ -	0.0%	\$ 6,230,000	CC	CA		
Vaperma Inc.	\$ 4,365,436	33.0%	\$ 4,781,798	36.1%	\$ 4,081,360	30.9%	\$ 13,228,594	CC	CA		
Round 6-2004B											
Angstrom Power Inc.	\$ 444,436	35.2%	\$ 588,835	46.6%	\$ 230,000	18.2%	\$ 1,263,271	CC	CA		
Clean Current Power Systems Inc.	\$ 1,582,000	33.0%	\$ 3,213,500	67.0%	\$ -	0.0%	\$ 4,795,500	CC	CA		
Electrovaya Corp.	\$ 1,667,998	33.0%	\$ 3,386,541	67.0%	\$ -	0.0%	\$ 5,054,539	CC	CA		
Encelium Technologies Inc. *	\$ 2,820,000	32.5%	\$ 5,845,000	67.5%	\$ -	0.0%	\$ 8,665,000	CC	CA		
Enerworks Inc. *	\$ 2,449,100	32.7%	\$ 5,040,000	67.3%	\$ -	0.0%	\$ 7,489,100	CC	CA		
General Electric Canada Inc. *	\$ 6,000,000	24.9%	\$ 15,700,000	65.1%	\$ 2,400,000	10.0%	\$ 24,100,000	CC	CA		
Group IV Semiconductor Inc.	\$ 2,145,000	33.2%	\$ 2,546,182	39.4%	\$ 1,769,000	27.4%	\$ 6,460,182	CC	CA		
Parkland BioFibre Ltd. *	\$ 3,000,000	27.0%	\$ 4,630,000	41.6%	\$ 3,500,000	31.4%	\$ 11,130,000	CC	CA		
Prairie Pulp and Paper Inc.	\$ 3,400,000	30.1%	\$ 7,589,068	67.2%	\$ 300,000	2.7%	\$ 11,289,068	CC	CA		CS
Pratt & Whitney Canada Corp. *	\$ 5,624,850	33.0%	\$ 11,139,150	65.4%	\$ 281,000	1.6%	\$ 17,045,000	CC	CA		
Science Applications International Corp. (SAIC Canada)	\$ 1,716,589	24.6%	\$ 2,412,009	34.5%	\$ 2,860,958	40.9%	\$ 6,989,556	CC	CA		
Sunarc of Canada Inc.	\$ 498,660	33.0%	\$ 469,104	31.0%	\$ 543,327	36.0%	\$ 1,511,091	CC	CA		
Terra Gaia Inc. *	\$ 5,300,000	16.3%	\$ 27,200,000	83.7%	\$ -	0.0%	\$ 32,500,000	CC	CA		CS
University of British Columbia *	\$ 2,342,600	33.0%	\$ 3,543,309	49.9%	\$ 1,213,005	17.1%	\$ 7,098,914	CC	CA		
Round 5-2004A											
Alternative Green Energy Systems Inc.	\$ 588,875	32.9%	\$ 1,200,518	67.1%	\$ -	0.0%	\$ 1,789,393	CC	CA		CS
Atlantic Hydrogen Inc.	\$ 2,000,000	31.0%	\$ 3,229,479	50.0%	\$ 1,225,000	19.0%	\$ 6,454,479	CC	CA		
Atlantic Packaging Products Ltd.	\$ 2,514,600	28.5%	\$ 6,322,117	71.5%	\$ -	0.0%	\$ 8,836,717	CC	CA		CS
Dofasco Inc. *	\$ 1,000,000	33.3%	\$ 2,000,000	66.7%	\$ -	0.0%	\$ 3,000,000	CC	CA		
Great Northern Power Corp. *	\$ 1,981,914	28.4%	\$ 5,006,200	71.6%	\$ -	0.0%	\$ 6,988,114	CC	CA		
M.A. Turbo/Engine Ltd.	\$ 152,844	46.0%	\$ 179,760	54.0%	\$ -	0.0%	\$ 332,604		CA		

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CC=climate change, CA=clean air, CW=clean water and CS=clean soil

Lead Consortium Member	Approved SDTC Funding	% of Total Eligible Project Costs	Eligible Recipient Funding Contribution	% of Total Eligible Project Costs	Other Government Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefit Bolded)		
QuestAir Technologies Inc. *	\$ 3,890,000	17.8%	\$ 15,593,000	71.4%	\$ 2,365,000	10.8%	\$ 21,848,000	CC	CA	
Techint Goodfellow Technologies Inc.	\$ 3,678,633	30.0%	\$ 6,933,477	56.5%	\$ 1,650,000	13.5%	\$ 12,262,110	CC	CA	
Xantrex Technology Inc. *	\$ 5,000,000	33.3%	\$ 10,000,000	66.7%	\$ -	0.0%	\$ 15,000,000	CC	CA	
Round 4-2003B										
BIOX Canada Ltd.	\$ 5,000,000	14.5%	\$ 25,504,071	73.9%	\$ 4,000,000	11.6%	\$ 34,504,071	CC	CA	
DeCloet Greenhouses Mfg. Ltd.	\$ 569,082	33.0%	\$ 960,408	55.7%	\$ 195,000	11.3%	\$ 1,724,490	CC		
Fifth Light Technology Ltd.	\$ 3,036,000	33.0%	\$ 3,914,000	42.5%	\$ 2,250,000	24.5%	\$ 9,200,000	CC		
Gradek Energy Inc. *	\$ 5,000,000	19.7%	\$ 9,422,000	37.2%	\$ 10,900,000	43.0%	\$ 25,322,000	CC		CS
Lignol Innovations Corp.	\$ 1,672,323	33.3%	\$ 2,955,667	58.9%	\$ 394,000	7.8%	\$ 5,021,990	CC	CA	
Nanox inc.	\$ 1,800,000	40.3%	\$ 1,238,248	27.7%	\$ 1,425,000	31.9%	\$ 4,463,248		CA	
NxtPhase T&D Corp.	\$ 986,220	30.6%	\$ 2,240,322	69.4%	\$ -	0.0%	\$ 3,226,542	CC		
Sacré-Davey Innovations Inc.	\$ 5,879,000	33.0%	\$ 4,596,140	25.8%	\$ 7,357,859	41.3%	\$ 17,832,999	CC	CA	
Synodon Inc.	\$ 650,000	24.8%	\$ 1,326,048	50.5%	\$ 647,740	24.7%	\$ 2,623,788	CC		
Whitefox Technologies Canada Ltd.	\$ 2,608,545	39.8%	\$ 3,944,525	60.2%	\$ -	0.0%	\$ 6,553,070	CC	CA	
Round 3-2003A										
Blue-Zone Technologies Ltd.	\$ 2,700,000	33.3%	\$ 4,500,000	55.6%	\$ 900,000	11.1%	\$ 8,100,000	CC		
Cansolv Technologies Inc. *	\$ 1,520,000	33.3%	\$ 3,042,000	66.7%	\$ -	0.0%	\$ 4,562,000	CC		
Cellex Power Products Inc.	\$ 2,000,000	22.2%	\$ 6,026,000	66.8%	\$ 1,000,000	11.1%	\$ 9,026,000		CA	
Hydrogenics Corp.	\$ 1,560,000	44.0%	\$ 1,594,182	45.0%	\$ 391,000	11.0%	\$ 3,545,182		CA	
Paradigm Environmental Technologies Inc.	\$ 250,000	20.7%	\$ 653,804	54.1%	\$ 305,000	25.2%	\$ 1,208,804	CC	CA	CW
Quantiam Technologies Inc.	\$ 1,450,000	14.8%	\$ 5,321,313	54.5%	\$ 2,997,000	30.7%	\$ 9,768,313	CC	CA	
RailPower Technologies Corp.	\$ 1,473,032	40.5%	\$ 1,911,870	52.6%	\$ 250,000	6.9%	\$ 3,634,902		CA	
Saskatchewan Power Corp.	\$ 1,782,900	24.2%	\$ 5,565,000	75.5%	\$ 20,000	0.3%	\$ 7,367,900		CA	
Round 2-2002B										
Enerkem Technologies Inc.	\$ 720,573	32.0%	\$ 1,301,047	57.7%	\$ 231,798	10.3%	\$ 2,253,418	CC	CA	CS
Ensyn Technologies Inc.	\$ 2,000,000	22.5%	\$ 3,295,871	37.0%	\$ 3,600,000	40.5%	\$ 8,895,871	CC	CA	

* Amounts are based on approved project values – contracting to be finalized.

CC=climate change, CA=clean air, CW=clean water and CS=clean soil

Lead Consortium Member	Approved SDTC Funding	% of Total Eligible Project Costs	Eligible Recipient Funding Contribution	% of Total Eligible Project Costs	Other Government Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefit Bolded)			
Highmark Renewables Inc.	\$ 1,000,000	14.2%	\$ 3,801,570	53.9%	\$ 2,254,675	32.0%	\$ 7,056,245	CC	CA	CW	CS
IBC Technologies Inc.	\$ 266,000	27.7%	\$ 677,580	70.6%	\$ 16,420	1.7%	\$ 960,000	CC	CA		
Mikro-Tek Inc.	\$ 500,400	14.4%	\$ 2,982,950	85.6%	\$ -	0.0%	\$ 3,483,350	CC			CS
Radiant Technologies Inc.	\$ 1,000,000	18.2%	\$ 4,181,000	76.0%	\$ 319,000	5.8%	\$ 5,500,000	CC	CA		
University of New Brunswick	\$ 260,000	41.8%	\$ 354,200	56.9%	\$ 8,000	1.3%	\$ 622,200	CC	CA		
West Lorne Bio-Oil Co-Generation Partnership	\$ 5,000,000	40.9%	\$ 7,215,947	59.1%	\$ -	0.0%	\$ 12,215,947	CC	CA		
ZENON Environmental Inc.	\$ 1,760,000	33.0%	\$ 3,574,000	67.0%	\$ -	0.0%	\$ 5,334,000	CC	CA	CW	
Round 1-2002A											
Bio-Terre Systems Inc.	\$ 864,375	37.5%	\$ 800,974	34.7%	\$ 639,651	27.8%	\$ 2,305,000	CC	CA	CW	CS
Carmanah Technologies Inc.	\$ 466,167	22.9%	\$ 1,568,895	77.1%	\$ -	0.0%	\$ 2,035,062	CC	CA		
CO ₂ Solution Inc.	\$ 858,707	14.6%	\$ 2,429,301	41.3%	\$ 2,593,550	44.1%	\$ 5,881,558	CC			
Mabarex Inc.	\$ 1,190,000	35.0%	\$ 1,960,000	57.6%	\$ 250,000	7.4%	\$ 3,400,000	CC	CA		
Nova Chemicals Corporation	\$ 320,000	22.7%	\$ 268,081	19.0%	\$ 820,000	58.2%	\$ 1,408,081	CC	CA		
Suncor Energy Inc.	\$ 2,250,000	26.8%	\$ 3,891,371	46.4%	\$ 2,250,000	26.8%	\$ 8,391,371	CC			
Westport Research Inc.	\$ 1,000,000	32.1%	\$ 1,565,376	50.2%	\$ 550,000	17.7%	\$ 3,115,376		CA		
Total	\$ 238,290,330	28.2%	\$ 498,964,623	59.0%	\$ 108,668,982	12.8%	\$ 845,923,936				

Project Classification

SDTC Approved Funding in Hydrogen Economy, Clean Fossil Fuels, Clean Water and Clean Soil Projects (as of December 31, 2006).

Project Type	Round	Lead Consortia Partner	Total Eligible Project Costs	Approved SDTC Funding
Hydrogen Economy Projects	Round 8 - 2005B	Hydrogenics Corp.	\$16,281,106	\$5,372,765
	Round 7 - 2005A	SHEC LABS (Solar Hydrogen Energy Corporation) *	\$6,230,000	\$2,076,667
	Round 7 - 2005A	AirScience Technologies Inc. *	\$3,248,000	\$1,038,180
	Round 6 - 2004B	Angstrom Power Inc.	\$1,263,271	\$444,436
	Round 5 - 2004A	QuestAir Technologies Inc. *	\$21,848,000	\$3,890,000
	Round 5 - 2004A	Atlantic Hydrogen Inc.	\$6,454,479	\$2,000,000
	Round 4 - 2003B	Sacré-Davey Innovations Inc.	\$17,832,999	\$5,879,000
	Round 3 - 2003A	Hydrogenics Corp.	\$3,545,182	\$1,560,000
	Round 3 - 2003A	Cellex Power Products Inc.	\$9,026,000	\$2,000,000
	9 Projects		\$85,729,037	\$24,261,048
Clean Fossil Fuel Projects	Round 8 - 2005B	TSC Company Ltd.	\$26,700,000	\$5,000,000
	Round 7 - 2005A	Petroleum Technology Research Centre *	\$9,603,000	\$3,168,990
	Round 7 - 2005A	N-Solv Corp.	\$29,283,280	\$8,604,672
	Round 4 - 2003B	Synodon Inc.	\$2,623,788	\$650,000
	Round 4 - 2003B	Gradek Energy Inc. *	\$25,322,000	\$5,000,000
	Round 1 - 2002A	Suncor Energy Inc.	\$8,391,371	\$2,250,000
	6 Projects		\$101,923,439	\$24,673,662
Clean Water / Clean Soil Projects	Round 9 - 2006A	Industrial Catalytic Technologies Inc.	\$2,513,016	\$829,295
	Round 9 - 2006A	GE ZENON ULC	\$7,660,000	\$2,553,000
	Round 8 - 2005B	Maritime Innovation *	\$2,952,380	\$979,800
	Round 8 - 2005B	The Pressure Pipe Inspection Company *	\$1,235,000	\$400,000
	Round 8 - 2005B	Ostara Nutrient Recovery Technologies Inc.	\$1,744,611	\$375,760
	Round 8 - 2005B	EcoVu Analytics	\$2,388,712	\$788,275
	Round 8 - 2005B	Chinook Mobile Heating & Deicing Corporation *	\$5,419,375	\$1,806,457
	7 Projects		\$23,913,094	\$7,732,587

* Amounts are based on approved project values – contracting to be finalized.

Classification Allocation % to Climate Change and Clean Air

The following represent the project classification allocation % to Climate Change and Clean Air for the projects approved for funding. SDTC selects projects for funding that meet the requirements of the mandate while at the same time meeting the allocation of the classification requirements in accordance with the Funding Agreement. While projects are classified in a primary benefit category, projects with multiple environmental benefits are encouraged as demonstrated below.

	# of Projects Funded	% of Funding Allocation
Total Number of Projects Funded	107	—
Projects with Climate Change Impact as a Primary Benefit	82	77%
Projects with Clean Air Impact as a Primary Benefit	18	17%
Projects with more than one Environmental Benefit	90	84%

Completed Projects

This section provides a summary list of all of the projects completed to-date. Seven were completed in 2005 and three in 2006.

Lead Consortium Member	Project Delivery Completion	Announced SDTC Funding	% of Total Eligible Project Costs	Eligible Recipient Funding Contribution	% of Total Eligible Project Costs	Other Government Funding	% of Total Eligible Project Costs	Total Eligible Project Costs
Round 5-2004A								
M.A. Turbo/Engine Ltd.	December 2006	\$ 152,844	46.0%	\$ 179,760	54.0%	\$ -	0.0%	\$ 332,604
Round 3-2003A								
Hydrogenics Corp.	September 2005	\$ 1,560,000	44.0%	\$ 1,594,182	45.0%	\$ 391,000	11.0%	\$ 3,545,182
Paradigm Environmental Technologies Inc.	October 2005	\$ 250,000	20.7%	\$ 653,804	54.1%	\$ 305,000	25.2%	\$ 1,208,804
Round 2-2002B								
Enerkem Technologies Inc.	January 2005	\$ 720,573	32.0%	\$ 1,301,047	57.7%	\$ 231,798	10.3%	\$ 2,253,418
Highmark Renewables Inc.	June 2005	\$ 1,000,000	14.2%	\$ 3,801,570	53.9%	\$ 2,254,675	32.0%	\$ 7,056,245
Mikro-Tek Inc.	June 2005	\$ 500,400	14.4%	\$ 2,982,950	85.6%	\$ -	0.0%	\$ 3,483,350
West Lorne Bio-Oil Co-Generation Partnership	July 2005	\$ 5,000,000	40.9%	\$ 7,215,947	59.1%	\$ -	0.0%	\$ 12,215,947
Round 1-2002A								
2A								
Carmanah Technologies Inc.	January 2005	\$ 466,167	22.9%	\$ 1,568,895	77.1%	\$ -	0.0%	\$ 2,035,062
CO ₂ Solution Inc.	June 2006	\$ 858,707	14.6%	\$ 2,429,301	41.3%	\$ 2,593,550	44.1%	\$ 5,881,558
Westport Research Inc.	August 2006	\$ 1,000,000	32.1%	\$ 1,565,376	50.2%	\$ 550,000	17.7%	\$ 3,115,376
TOTAL		\$ 11,508,691	28.0%	\$ 23,292,832	56.6%	\$ 6,326,023	15.4%	\$ 41,127,546

Note: Amounts for Projects completed in 2006 are based on the submitted SDTC Project Financial Certification Report.

For each project completed, an evaluation of the Project Impact has been included within this section. The Project Impact considers the results of the project from both a technology and path to market perspective as well as calculating the environmental impacts. Post-project reporting will continue so as to understand the evolution of the technologies and the Market Impact of each funded project.

It is important to recognize that SDTC funding is focused on the development and demonstration of new technologies. In so doing, projects progress from early development along the innovation chain towards commercialization. This staged approach to innovation will result in some successful projects providing technology that require further development and/or demonstration before they can be commercialized. It is expected that not all projects will be successful considering the unproven nature of the technologies.

Overall, the results to date are encouraging. While project impacts vary depending on the nature and the stage of the projects, all 10 projects have achieved positive results that will enable them to move to the next stage of their progress to market.

Project Name: M.A. Turbo/Engine Ltd.**Round 5-2004A**

Sector:

Transportation

Project Delivery

Completion:

December 2006

Market Impact

Report Due:

December 2008**Objectives:**

To demonstrate that the project Continuous Water Injection (CWI) system, which relies on injection of water into the intake combustion air stream of diesel engines, results in reductions of: NO_x, GHG and PM emissions; fuel consumption; and engine wear.

To develop a 'bolt-on' CWI kit that can be installed in target applications by any trained mechanic.

Results:

- The CWI system was successfully demonstrated in two diesel engine applications: a 5.9 liter, turbocharged diesel pickup truck, and a 1050 hp 4-stroke rail locomotive.
- In both test cases, reductions in NO_x, fuel consumption, and related GHG emissions were observed. PM, only measured in the locomotive case, was also reduced. CO emissions vary depending on the level of NO_x reductions.
- The testing has verified that the technology can be tuned to achieve a desired range of emission reduction profiles (NO_x, PM, CO₂ and CO).
- Testing was completed consistent with Environmental Protection Agency protocols for specific test cycles.

Project Impacts:

- Truck impacts (city driving cycle): NO_x: 0.8 g/km (18%) reduction; CO₂: 6.1 g/km (1.5%) reduction; Fuel Consumption: 0.2 L/100km (1.5%) reduction; CO: 0.1 g/km (16%) increase
- Locomotive impacts (all reductions): NO_x: 18 g/MWh (25%); PM: 0.11 g/MWh (11%); CO: 7.3 g/MWh (3%); CO₂: 12 g/MWh (1.5%); Fuel Consumption: 4.0 L/MWh (1.5%)

Path to Market:

- M.A.Turbo/Engine's CWI technology can be applied to a wide range of applications, and is well-suited for retrofitting of existing engines during maintenance overhauls as well as new installations. While initially developed for use in marine engines, future markets include a range of stationary, on-road and off-road diesel applications.
- Cumulative emissions impacts from installation of CWI technology in port/construction equipment and stationary generator applications for the 2007 to 2014 period estimated at: NO_x: 32 kt reduction; CO₂: 370 kt reduction; CO: 44 kt increase.
- Emissions impacts for locomotive applications were not available at time of printing.

Project Name: Hydrogenics Corp.**Round 3-2003A**

Sector:

Transportation

Project Delivery

Completion:

September 2005

Market Impact

Report Due:

September 2007**Objectives:**

To reduce the costs of fuel cell technology in transportation applications using an early niche market with viable economics. This approach was intended to provide a pathway to the larger transportation market.

Results:

- Significant technology milestones were achieved by Hydrogenics during their demonstration project, including their first-ever deployment of fuel cell forklift power packs. Over 1000 hours of operational time were logged in the field with minimal maintenance and reliability issues and high driver satisfaction.
- The project showed its intended value as a cost-reduction step in moving to a hydrogen economy.

Project Impacts:

- Emissions intensity (propane forklift replacement): reduction of 9 tonnes CO₂e per year per vehicle; reduction of CO, NO_x, and VOCs by 1.5, 0.23, and 0.18 tonnes per year per vehicle, respectively
- Emissions intensity (battery forklift replacement): increase of 5 tonnes CO₂e per year per vehicle

The emissions benefits of hydrogen-powered vehicles are substantially reduced in this project based on the inclusion of electrolysis-generated hydrogen, which accounts for approximately 0.5 tonnes CO₂e per MWh.

Path to Market:

- Further development and demonstration is required to achieve broader operating parameters prior to market entry.

Project Name: Paradigm Environmental Technologies Inc.

Round 3-2003A

Sector:

Waste Management

Project Delivery

Completion:

October 2005

Market Impact

Report Due:

October 2007

Objectives:

To demonstrate the effectiveness of Paradigm's MicroSludge™ process for the reduction of volatile solids in municipal waste water treatment plants.

Results:

- Over 90% reduction in volatile solids were realized when Waste Activated Sludge (WAS) was treated with the MicroSludge™ process – considered an exceptional result for the industry.
- Increased generation of biogas.
- Reduction in GHGs and Criteria Air Contaminants (CACs) emitted during waste transport and GHG emissions once solid residuals are applied to land.
- Reduction in land use requirements.

Project Impacts:

- Emissions Intensity (avoided landfill): reduction of 3,000 tonnes CO₂e per 1,000 tonnes of WAS
- Emissions Intensity (waste-to-energy): reduction of 8,500 tonnes CO₂e per 1,000 tonnes of WAS

Path to Market:

- Increased biogas production can be used to generate additional renewable electricity and heat energy, reducing GHG and CAC emissions associated with the combustion of fossil fuels it would displace. The demonstration project did not include conversion of biogas to electricity, but power generation would be expected at facilities during market roll-out.
- The successful Paradigm demonstration project has led to significant interest in North America and abroad for the technology, including the delivery of an evaluation system to a potential customer in Los Angeles, CA.

Project Name: Enerkem Technologies Inc.

Round 2-2002B

Sector:

Waste Management

Project Delivery

Completion:

January 2005

Market Impact

Report Due:

January 2007

Objectives:

To reduce GHG emission relative to a benchmark land filling case by synthesizing mixed alcohols (methanol and ethanol) from municipal solid waste (MSW). One of the key objectives was to make gasification more affordable to smaller municipalities by creating higher-value end products.

Results:

- The project resulted in the successful integration, at a pilot scale, of Enerkem's existing waste sorting and gasification processes with an alcohol synthesis process, resulting in the production of methanol from biomass versus conventional methanol production using natural gas. This project has positioned the company to produce higher-value product streams from MSW feedstocks.
- Other environmental benefits to air (e.g. reduced landfill gas emissions), water and soil (e.g. lower quantities of leachate contaminants, reduced land use) associated with diverting waste from landfill would also be expected.

Project Impacts:

- Emissions intensity: reduction of 1.3 tonnes CO₂e / dry tonne MSW processed, when compared against a benchmark landfilling case involving 50% landfill gas capture

Over 90% of these benefits are attributed to displacement of landfill gas emissions from conventional waste disposal practices (a benefit of Enerkem's pre-existing waste sorting and gasification processes), with relatively low remaining benefits due to alcohol synthesis.

Path to Market:

- Enerkem considers the project to be one of a number of steps along the way to producing high-value products from waste, which could enable additional environmental and economic benefits.

Project Name: Highmark Renewables Inc.

Round 2-2002B

Sector:

Agriculture

Project Delivery

Completion:

June 2005

Market Impact

Report Due:

June 2007

Objectives:

To utilize Alberta Research Council's Integrated Manure Utilization System (IMUS) system to generate electricity and heat from manure-derived biogas. A further objective was to test the system in field operations on one of Canada's largest cattle feedlots.

Results:

- Successful demonstration of the IMUS technology and the production of biogas that was consistent with quantity & quality expected from lab scale process.
- Reduction in emissions of methane, nitrous oxide and dust typically generated by unprocessed manure when it is piled and spread.
- Avoidance of GHG and CAC emissions that would have been created by the combustion of fossil fuel to generate electricity and heat/steam. Further reductions of GHGs and CAC emissions resulted by eliminating the need to transport and spread manure.
- Lower surface and ground water contamination by removing excess nitrogen, phosphorous, soluble salts and pathogens.
- Production of stabilized organic fertilizer—thereby offsetting the need for chemical fertilizers and associated emissions to manufacture such products.

Project Impacts:

- Emissions intensity: reduction of 1.28 tonnes CO_{2e} per head of cattle
- Tonnes of land application avoided: 3000 tonnes (3.5 kg/head/day)
- Avoided surface water contamination (pathogen removal)

Path to Market:

- It is estimated that the introduction of ten-3 MW IMUS units in Ontario alone (between 2007 and 2010) could result in the cumulative reduction of up to 171 kt of CO_{2e}.

Project Name: Mikro-Tek Inc.**Round 2-2002B**

Sector:

Forestry, Wood**Products and Pulp and****Paper Products**

Project Delivery

Completion:

June 2005

Market Impact

Report Due:

June 2007**Objectives:**

To demonstrate enhanced grass-species biomass growth using mycorrhizal fungi inoculation to improve soil organic carbon (SOC) levels.

Results:

- Improved retention of soil nutrients, and reduced nutrient run-off into nearby watercourses and groundwater
- Better uptake of a range of nutrients (including phosphorous) by plants, which can have benefits in terms of disease resistance, crop quality, etc.
- More rapid growth of reclamation grasses on poor quality soils.
- Identification of gaps in the industry's ability to measure and monitor SOC levels.
- Improved yields attained in the laboratory-based inoculum production process to the point where the more time-consuming and costly field production method (growing the microorganism on plant roots in the field) could be completely replaced by the lab method. The lab method avoids the need for agricultural inputs (fertilizer, etc.) and related environmental impacts.
- Ability to produce the inoculum in a pure form which facilitates the licensing of the organism to other companies.

Project Impacts:

- Given the complexity of the project and difficulties of measurement, conclusive GHG benefits for the demonstration project and for the market roll-out have not yet been determined. Further work has been proposed to develop an industry practice for soil organic carbon sequestration from grasslands to ensure conclusive results.

Path to Market:

- The project may lead to quantifiable GHG benefits in the future if increased growth rate properties of the technology are used to grow higher yield biomass fuel crops (thus resulting in increased amount of displaced fossil fuel) and grassland-based GHG emissions reduction protocols are developed.
- Development of reliable technology to measure SOC may be a significant opportunity for the sector by allowing accurate quantification of increases in SOC resulting from the use of technologies such as those demonstrated in the project. This could lead to enhanced economic returns through more certain access to carbon trading markets.

Project Name: West Lorne Bio-Oil Co-Generation Partnership

Round 2-2002B

Sector:

Power Generation

Project Delivery

Completion:

July 2005

Market Impact

Report Due:

July 2007

Objectives:

To demonstrate that biomass to energy conversion using pyrolysis can be achieved economically and technically at a scale of production which would enable subsequent deployment.

Results:

- DynaMotive's pyrolysis process was used to generate BioOil and subsequently fuel an Orenda turbine to generate electricity. When compared to a baseline using fossil fuels, primary benefits included: reduction of GHGs, SO_x, NO_x and associated criteria air contaminants (CACs) such as heavy metals and particulates.
- Secondary benefits included the reduction of methane emissions (i.e. landfill gas) and leachate contaminants by diverting biomass destined for landfill disposal.
- For turbine operation using BioOil, CAC emissions are significantly lower than fossil fuel emissions, according to tests conducted for TerraChoice Environmental certification.

Project Impacts:

- Emissions intensity: reduction of ~ 212 kg CO₂e/t of biomass
- Emissions intensity: 7.6 kg /MWh reduction of NO₂; 19.4 kg /MWh reduction of SO₂

BioOil electrical generation was reported to be 0.85 kg CO, 1.60 kg NO₂, 0.057 kg SO₂ and 0.09 kg PM. Canada average fossil-based electricity generation (NO_x= 9.2 kg/MWh; SO_x = 19.5 kg/MWh) {Reference: Statistics Canada. Electricity Generation and GHG Emissions in Canada (1990-2001)}

Path to Market:

- Once fully operational each plant is expected to reduce GHG emissions by 7 kt CO₂e/year. A cumulative reduction of 140,000 t CO₂e is expected over each plant's expected 20-year lifetime.

Project Name: Carmanah Technology Inc.

Round 2-2002A

Sector:

Energy Utilization

Project Delivery

Completion:

January 2005

Market Impact

Report Due:

January 2007

Objectives:

Carmanah's technology uses renewable solar energy and a Light Emitting Diode lighting system which is intended to remove the need for grid electricity. Further, the project aims to demonstrate safer environments at night (such as in public transit bus stops) where grid connection is not feasible. A key objective of the project is to establish an early niche market for photovoltaic lighting which will assist in lowering the costs of PV-based electricity generation. Emissions reductions are expected over the longer term.

Results:

- The project produced sufficient units for demonstration purpose. In fact, SDTC funding of Carmanah appears to have catalyzed market roll-out and led to significant sales (greater than projected for market rollout) being realized by the company immediately after completion of project delivery. Carmanah executives noted that *"the economic return to date from the \$500,000 investment from SDTC has been approximately \$8 million in sales of LED edge-lighting in the first year after completion of the project (e.g. sold 2700 bus signs and 200 traffic signs in 2005), with total employment in sales, engineering and production of approximately 40 staff, and the creation of two manufacturing facilities, one in Calgary and one in Victoria."*

Project Impacts:

- Emissions intensity (address signs): reduction of 0.013t CO₂e / unit / year
- Emissions intensity (traffic signs): reduction of 0.0967 kg CO₂e / unit / year
- Emissions intensity (bus shelter signs): reduction of 0.129 t CO₂e/ unit /year

Based on displacement of fossil fuel-generated electricity associated with running conventional light bulbs.

Path to Market:

- Significant benefits could be realized during market roll-out of the technology – it is estimated that if 60,000 units were sold in Canada and the U.S. by 2010 it could result in a cumulative reduction of up to 21 kt of GHG reduction depending on a number of variables including location of installation, timing, and type and final number of units sold.

Project Name: CO₂ Solution

Round 2-2002A

Sector:

Energy Exploration and Production

Project Delivery

Completion:

June 2006

Market Impact

Report Due:

June 2008

Objectives:

CO₂ Solution has developed a process for removing CO₂ from CO₂-containing exhaust gas streams using a novel enzymatic approach for converting CO₂ dissolved in an aqueous solution into aqueous bicarbonate. The objectives of the SDTC funded project were:

- To develop a scaled-up, first generation, portable prototype based on this process to demonstrate its ability to absorb CO₂ from industrial scale waste process gas streams, in this case a municipal solid waste incinerator exhaust stream.
- To demonstrate that once converted to bicarbonate, the CO₂ could be precipitated and potentially sequestered through the formation of mineral-carbonates.

Results:

- The project successfully demonstrated the ability to remove up to 36% of the CO₂ content in a municipal solid waste incinerator exhaust stream.
- The project also demonstrated that the removed CO₂, once converted to aqueous bicarbonate, can be precipitated into a useful mineral-carbonate (calcium carbonate (CaCO₃)) through a reaction of the aqueous bicarbonate with hydrated lime.
- Since significant GHG emissions are associated with production of the hydrated lime precipitating agent, the project itself did not result in a net emission reduction. However, it is expected that alternative mineral sources with fewer associated emissions such as sodium chloride (NaCl) or other lower impact means for sequestering the CO₂ absorbed by the CO₂ Solution process will lead to a significant net emission reduction process that can be applied to a wide variety of industrial exhaust streams in the future.

Project Impacts:

- The demonstrated fraction of CO₂ absorbed from the municipal solid waste incinerator exhaust stream was in the range of 23% to 36%, depending on process conditions.
- The result is significant given that such processes typically vent 100% of the CO₂.

Path to Market:

- The target market for the CO₂ Solution process technology is potentially very broad and diverse and could essentially include any industry with effluent streams containing CO₂.
- Early demonstration efforts have focused on CO₂ emission streams from the aluminum, waste incineration and steam reforming of natural gas (hydrogen production) industries.
- The timing and the extent of the penetration of this technology into the market will depend heavily on its ability to demonstrate a net CO₂ emissions reduction through the development of an alternative mineral bicarbonate precipitation process with a lower lifecycle GHG intensity or another process for permanently sequestering CO₂.

Project Name: Westport Research Inc.**Round 2-2002A**

Sector:

Transportation

Project Delivery

Completion:

August 2006

Market Impact Report

Due:

August 2008**Objectives:**

Demonstrate the technical and economic feasibility of operating heavy-duty (Class 8) trucks in a line-haul application using liquefied natural gas (LNG) as the primary fuel instead of diesel by operating five trucks with HPDI fuel systems for a period of one year in commercial operation along the 401 highway corridor in Southern Ontario.

Demonstrate that Westport's proprietary High-Pressure Direct Injection (HPDI) technology can result in significant reductions of Nitrogen Oxides (NO_x), Particulate Matter (PM) and GHG emissions.

Results:

Westport's HPDI technology demonstrated:

- a significant reduction in NO_x, PM and carbon monoxide (CO) emissions compared to traditional diesel systems;
- a reduction in carbonyl compound and selected toxic hydrocarbon emissions over the diesel baseline; and
- a potential for reduced GHG emissions*

Project Impacts:

The project demonstrated tank-to-wheel contaminant emissions reductions compared to the diesel baseline of:

- 40% for NO_x
- 85% for particulate matter (PM)
- 95% for CO
- 85% for carbonyl compounds
- 95% for selected toxic hydrocarbons

Path to Market:

- The target market for the Westport HPDI technology is expected to be transport truck fleets operating in high trucking traffic corridors.
- Although any market penetration of this technology will lead to significant reductions of NO_x, PM, CO and other contaminant air emissions, the extent of GHG emission reductions will depend on the development of an efficient and well distributed LNG fueling infrastructure and the further refinement of the HPDI technology.
- Assuming that Westport increases HPDI engine system sales annually by 20%, annual GHG emission reductions resulting from this project could reach 130 kt CO₂e per year by 2015, with total cumulative reductions of 250 kt CO₂e over that period.

*This assumes: transport trucks in which HPDI systems are installed travel distances of roughly 150,000 km per year; 15 units will be sold for commercial use in 2008; and emission reductions of 360 g CO₂e/km.

2006 Completed Projects – Market Impacts

In accordance with the Funding Agreement, a Final Market Impact report is required two years after project completion. As of December 31, 2006 there are no completed projects that fall under this category.

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