

2007

ANNUAL REPORT SUPPLEMENT



SUSTAINABLE DEVELOPMENT
TECHNOLOGY CANADA™

Supplement to the 2007 Annual Report

Introduction	2
Section 1 - SD Tech Fund™ Introduction.....	3
Section 2 - SD Tech Fund™ Portfolio Project Descriptions	5
Section 3 - SD Tech Fund™ Portfolio Approved Project Funding Summary.....	48
Section 4 - SD Tech Fund™ Project Classification	55
Section 5 - SD Tech Fund™ Completed Projects	57
Section 6 - NextGen Biofuels Fund™ Introduction.....	75
Section 7 - NextGen Biofuels Fund™ Portfolio Project Descriptions.....	76
Section 8 - Index of SDTC Funded Project Descriptions.....	77



SUSTAINABLE DEVELOPMENT
TECHNOLOGY CANADA™

Partnering for real results.

Associated documents available on our website www.sdtc.ca

2007 Annual Report

2008 Corporate Plan Executive Summary

Introduction

In accordance with the terms and conditions of both Funding Agreement Three pertaining to the Sustainable Development Technology Fund (SD Tech Fund™) between Sustainable Development Technology Canada (SDTC) and the Government of Canada, executed March 31, 2005, and the Funding Agreement pertaining to the Next-Generation Biofuels Fund (NextGen Biofuels Fund™) between the same parties executed September 04, 2007, SDTC is required to publish an Annual Report Supplement to provide specific additional details of projects funded by SDTC. Within this supplement, SDTC provides the required information relating to both Funds.

This Annual Report Supplement is to be tabled in Parliament along with the Annual Report and the Corporate Plan Executive Summary by the Minister of Natural Resources. In addition, all of these documents will be made available to the public on SDTC's website (www.sdtec.ca).

Purpose and Selection Criteria of each Fund

Each Fund has a unique purpose and set of criteria for qualifying, assessing and approving projects. This is summarized in this report, at the beginning of the respective sections, for the SD Tech Fund™ and the NextGen Biofuels Fund™.

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

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 Directors 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.



SD Tech Fund™ Introduction

Purpose

The purpose of the SD Tech Fund™ is to:

- fund the development and demonstration of new sustainable development technologies related to climate change, clean air, clean water, and clean soil in order to make progress towards sustainable development;
- foster and encourage innovative collaboration and partnering amongst diverse persons in the private sector and in academic and not-for profit organizations to channel and strengthen the Canadian capacity to develop and demonstrate sustainable development technologies with respect to climate change, clean air, clean water, clean soil; and
- ensure timely diffusion by funded recipients of new sustainable development technologies in relevant market sectors throughout Canada.

Funding provided by SDTC is considered to be non-repayable provided Eligible Recipients meet the required conditions of the contribution.

Eligible Projects

To be eligible, a project must be carried on, or primarily carried on, in Canada 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;

Section 1 – SD Tech Fund™ Introduction

- 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;
- 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.

More detail on the funding process can be found in the Funding section of the SDTC website at: www.sdtc.ca

SD Tech Fund™ Portfolio Project Descriptions

This Section of the report provides a brief description for each active project approved for funding by SDTC's Board of Directors for all rounds since the commencement of the Foundation's activities in 2001. As such, it includes an update of funded projects' financials and related consortium members as of December 31, 2007 (Rounds 1 – 2002A to 11 – 2007A). The rounds specifically approved in 2007 are Rounds 10 – 2006B and 11 – 2007A. Information on the completed projects can be found in Section 5 of this report.

Biothermica Technologies Inc.

Round 11-2007A

Environmental benefits: Climate Change

Total Project Value:

\$1,557,080

SDTC Funding:

\$513,836

Leveraged Funding:

\$1,043,244

Oxidation of Methane in Coal Mine Air Exhaust

Biothermica Technologies Inc. and its partner, Hillsborough Resources Ltd., will demonstrate a technology that can oxidize low levels of methane, contained in the ventilation air of underground coal mines, to carbon dioxide. This process reduces GHG emissions and allows the resulting carbon credits to be sold on the carbon trading market. A 1/10th scale demonstration unit will be installed at Hillsborough Resources Ltd.'s Quinsam coal mine near Campbell River, BC.

Consortium Members

Biothermica Technologies Inc.

Hillsborough Resources Ltd.

Corporation HET -

Horizon Environnement Technologies

Round 11-2007A

Environmental benefits: Climate Change / Clean Water / Clean Soil

Total Project Value:

\$3,594,898

SDTC Funding:

\$1,186,316

Leveraged Funding:

\$2,408,582

Demonstration Project for the Valorization of Whey from the Cheese Industry

Unlike large cheese factories, small- and medium-sized cheese factories do not have economic ways to deal with waste from their operations. HET proposes to develop and demonstrate a commercial scale continuous aerobic bioreactor that converts a waste by-product of cheese production (whey) to a valuable product (animal feed). The technology converts 90% of the whey effluent to yeast based biomass and useful heat. The process provides an alternative whey disposal option to existing restrictive land and sewer disposal options that limit the operation and expansion of small and medium-sized cheese factories. The biomass is used as growth factor additive for animal feed without the risk of viral risk contamination considering it is a non-animal protein source.

Consortium Members

Corporation HET - Horizon Environnement Technologies

Fromagerie Perron

NUTRECO Agresearch

Développement Effenco inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$1,390,516

SDTC Funding:

\$465,166

Leveraged Funding:

\$925,350**Hybrid Refuse Truck**

Développement Effenco and its partners will complete the development and demonstration of a new hybrid hydraulic regenerative braking system dedicated to refuse trucks. Using a hydraulic pump, the system regenerates kinetic energy while the truck is braking. The energy is stored in a hydraulic accumulator to be reused later in the hydraulic operations of the vehicle. This system is more cost effective than hybrid electric solutions, and the project aims to reduce fuel consumption by 20% and improve brake lifespan by a factor of three. The demonstration will validate these performance targets by collecting data from five different trucks operating on waste collection routes.

Consortium Members

Développement Effenco inc.

Gaudreau Environnement inc.

Waste Management Quebec Inc.

Private refuse truck fleet operators

Transport Canada

Agence de l'efficacité énergétique du Québec

Centre de l'entrepreneurship
technologique de l'école de
technologie supérieure

EnQuest Power Corp.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air / Clean Water / Clean Soil

Total Project Value:

\$13,033,266

SDTC Funding:

\$3,302,500

Leveraged Funding:

\$9,730,766**Redefining the Relationship between Energy and Waste**

Provinces and municipalities are under increasing pressure to provide landfill diversion alternatives and to relieve the strain on the electrical power system. EnQuest has developed an economic and efficient method to divert municipal solid waste from local landfills and to convert it into clean energy. The consortium led by Enquest Power Corp. will use EnQuest's proprietary Aqueous Transformation (AqT) technology to demonstrate solutions to the challenges of municipal waste management and renewable energy production. The consortium will construct a 5.8-Megawatt energy-from-waste power plant next to a major greenhouse operation. This plant will process 26,000 tonnes of municipal solid waste per year. The electricity from EnQuest's power plant will be sold to the electricity grid. Norfolk County will provide the waste input and the greenhouse operator will use the waste heat generated through cogeneration to generate steam and/or hot water. This AqT oxygen deprived gasification process makes it easier to clean the syngas and has near zero generation of dioxin and furans. It has the additional benefit of significantly reducing carbon dioxide per unit of electricity generated.

Consortium Members

EnQuest Power Corp.

University of Toronto

Clean 16 Technologies Corp.

EnviroTower Inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Water

Total Project Value:

\$2,282,918

SDTC Funding:

\$730,534

Leveraged Funding:

\$1,552,384**Industrial Cooling Tower Environmental Water Treatment**

Cooling towers are a critical process in many industrial operations. These systems consume a tremendous amount of chemicals which typically are discharged to sewers. EnviroTower will demonstrate an industrial application of a patented cooling tower water treatment system as a more reliable, effective and economical alternative to traditional chemical water treatment. The technology is an innovative real-time process control system and is the adaptation of existing patented Electrostatic Water Treatment technology. The system enables industrial facilities to reduce cooling tower costs, lower energy and water consumption, reduce the risk of process interruption, improve operator safety, and reduce chemical discharges to sewage systems.

Consortium Members

EnviroTower Inc.

Toyota Motor Manufacturing Canada

Ferrinov Inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air / Clean Soil

Total Project Value:

\$5,652,334

SDTC Funding:

\$1,864,334

Leveraged Funding:

\$3,788,000**Hydrometallurgical Separation Process for Steel Mill Electric Arc Furnace (EAF) Dust and Recovery of Pigments**

In North America, electric arc furnaces produce approximately 1.1 tonnes of steel mill dust (EAF dust) annually. 50% of EAF dust is disposed of in landfill; the other 50% is treated by energy intensive processes. Ferrinov has developed a patented hydrometallurgical process for the treatment of EAF dust and the recovery of valuable ferrites and magnetites. These ferrites and magnetites are transformed into anti-corrosion pigments for use in paint manufacturing. Compared to pyrometallurgical treatment of EAF dust, Ferrinov's process represents a reduction in energy intensity of up to 80%. The process consumes only about 15% of the energy input typically required for the production of pigments. Ferrinov is partnering with Dofasco and Mittal Canada, the two major steel manufacturers in Canada, to further develop and demonstrate this technology to provide a more sustainable alternative to EAF dust disposal, with resultant benefits in reduced GHG emissions and minimized use of land fill.

Consortium Members

Ferrinov Inc.

Dofasco Inc.

Mittal Canada Inc.

Centre de recherche en environnement
UQAM/Sorel-Tracy (CREUST)Université du Québec à Montréal
(UQAM) / Département des Sciences
de la Terre

General Electric Canada

Round 11-2007A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$21,922,000

SDTC Funding:

\$7,307,000

Leveraged Funding:

\$14,615,000**Clean Diesel Locomotive Demonstration**

As new emissions standards emerge in Canada, the rail industry is faced with increasing challenges to remain competitive. GE Canada and its partners will develop and demonstrate a retrofit emissions control package for use on diesel locomotives, thereby propelling the Canadian railway industry to the forefront of emissions control. They will incorporate state-of-the-art Diesel Particulate Filtration (DPF) targeted to reduce particulate matter emissions by more than 85% from US EPA Tier 2 emission standards. Innovative Selective Catalytic Reduction technology will also be integrated into the locomotive to reduce NOx emissions by more than 65%. The project will also utilize biodiesel fuels to demonstrate compatibility with NOx and PM emissions reduction technology. CN will host the Clean Diesel Locomotive project on its newer GE locomotives used both in Canada and the US. CP will host the project to modernize old Electro-Motive Diesel (EMD) SD40-2 locomotives, expecting to reduce NOx 24%, Hydrocarbon 29% and GHGs 20%, and to improve fuel and lube oil consumption and improve availability. CP will test the DPF and biodiesel on the modernized EMD locomotives.

Consortium Members

GE Canada

CN Rail

CP Railways

GE Global Research

GE Company

University of Toronto

BIOX Corp.

GE Transportation

Engine Systems Development Center (ESDC)

CAD Railway Services (CAD)

ESW Canada

Umicore Autocat Canada Corp.

HSM Systems Inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$4,260,000

SDTC Funding:

\$1,402,750

Leveraged Funding:

\$2,857,250**Hydrogen Storage Solutions for Transportation and Energy Applications**

Cost-effective hydrogen storage is a key enabler to the development of hydrogen infrastructure. HSM Systems Inc. is developing a novel hydrogen storage system using aluminum based hydride materials (alane or AlH₃ complex) and the use of super critical fluid such as supercritical CO₂ and dimethyl ether to facilitate hydrogenation. Compared to other forms of hydrogen storage systems like compressed gas cylinders and liquid hydrogen, the HSM system provides a safe, low cost, low weight and high energy alternative to storing and transporting hydrogen. The system is expected to meet or exceed the criteria established by the U.S. Department of Energy and the Institute of Economic Affairs for economical hydrogen storage. Safe and economical means of hydrogen storage and transport is a key infrastructure hurdle to broadening the use of hydrogen.

Consortium Members

HSM Systems Inc.

University of New Brunswick (UNB)

Hawaii Hydrogen Carriers LLC (HHC)

United Technology Corp. (UTC)

Linweld Inc.

Menova Energy Inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$8,037,000

SDTC Funding:

\$2,684,000

Leveraged Funding:

\$5,353,000**Solar Concentrating Photo Bio-Reactor**

The use of algae to sequester CO₂ and produce biodiesel offers tremendous promise if growing conditions can be offered at an industrial scale. The consortium led by Menova Energy Inc. will develop and demonstrate the technical and commercial viability of a Solar Concentrating Photo Bio-Reactor (SC-PBR) for sequestering CO₂ emissions from compressor stations (and other installations in the fossil fuel, power generation sector), and for the subsequent production of biofuels. The project will integrate existing proprietary solar concentrating technology with a new closed loop proprietary PBR system using algae both to sequester the CO₂ and to generate significant quantities of feedstock for biofuels and other high value applications. End users will be able to convert a process waste and greenhouse gas (CO₂) into a valuable feedstock for bio-fuel production.

Consortium Members

Menova Energy Inc.

Trident Exploration Corp.

MSR Innovations Inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$1,115,996

SDTC Funding:

\$371,998

Leveraged Funding:

\$743,998**SolTrak™ Demonstration**

Improving systems installation of Building Integrated Photovoltaic (BIPV) is a key priority for the solar industry. MSR Innovations and its consortium partners plan to develop and demonstrate a unique solar roofing system which dramatically improves installation of solar PV. The system's extensive design and manufacturing flexibility produces a sustainable product that will reduce the costs of solar power systems, enabling mainstream market entry. Increased access to and availability of renewable energy will create a corresponding reduction of greenhouse gas emissions associated with traditional power generation.

Consortium Members

MSR Innovations Inc.

Century Group Lands Corp.

EMS Grivory

Advantage Tool & Machine

Lynn Solar

St-Jean Photochimie

Round 11-2007A

Environmental benefits: Climate Change / Clean Air / Clean Soil

Total Project Value:

\$5,006,107

SDTC Funding:

\$1,637,656

Leveraged Funding:

\$3,368,451**Low Cost Printable Organic Solar Cells**

The high cost of PV cells is a major obstacle for wider adoption of solar power generation, a renewable source of electricity which can provide GHG emission reduction benefits by displacing conventional power generation based on fossil fuels. St-Jean Photochimie has teamed up with Université Laval to produce a new polymer derivative which promises to greatly reduce the cost of solar photovoltaic (PV) cells. This unique polymer has higher material stability and light absorption properties than its nearest competition. The aim of the project is the development of a novel manufacturing process for the fabrication of the polymer at a cost of less than US \$1.00/Wp with a power conversion efficiency of 8%.

Consortium Members

St-Jean Photochimie

Konarka Technologies Inc.

National Research Council – Institute for Microstructural Sciences

Université Laval – Department of Chemistry

TM4 Inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$11,572,083

SDTC Funding:

\$3,818,787

Leveraged Funding:

\$7,753,296**TM4 Hybrid Drive System**

A new joint venture of TM4 and Magna Electronics Inc. will design, develop and demonstrate a new automotive electric powertrain based on TM4's high density permanent magnet motor. TM4 has developed a permanent magnet, outer rotor, electric motor technology, power electronics and control technologies which will enable car manufacturers to offer superior gasoline-electric hybrid technology. Magna's experience in producing quality automotive products at the lowest possible price will enable large automotive OEMs to integrate this Electric All Wheel Drive (E AWD) system on existing platform. The E AWD system will use stored electric energy to send torque and power to the rear wheels from standstill through vehicle acceleration and whenever more torque or traction is required. The E AWD system will recharge the battery pack through regenerative braking and during coasting. It will be able to operate in ZEV mode (Zero Emissions Vehicle) under limited load conditions.

Consortium Members

TM4 Inc.

Magna Electronics

Trilogics Technologies Inc.

Round 11-2007A

Environmental benefits: Clean Air / Clean Water / Clean Soil

Total Project Value:

\$1,425,000

SDTC Funding:

\$400,000

Leveraged Funding:

\$1,025,000**Sustainable Utility Infrastructure**

Current practice requires organizations with significant assets, such as municipalities, to undertake expensive studies if they wish to understand how to improve their environmental performance. Trilogics proposes to demonstrate enabling technology, using its Infrastructure Asset Intelligence system to interconnect the existing business, operational and generic IT systems to enable better problem resolution and decision making. In many Canadian municipalities, leakage rates from potable water infrastructure can exceed 40%. A pilot project with a specific focus on the water and wastewater infrastructure will be undertaken in the Municipality of Kingston, Ontario before a city-wide implementation is undertaken. A successful demonstration will result in identifying opportunities to reduce water losses, wastewater infiltration and exfiltration, and their related environmental impacts.

Consortium Members

Trilogics Technologies Inc.

Utilities Kingston

Hatch Mott MacDonald

Fuseforward Inc.

Vidir Biomass Inc.

Round 11-2007A

Environmental benefits: Climate Change / Clean Air / Clean Soil

Total Project Value:

\$12,658,000

SDTC Funding:

\$4,570,000

Leveraged Funding:

\$8,088,000**Demonstration of Community Combined Heat and Power (CHP) District Heating System Using Standardized Agricultural Solid Bio-fuels**

Cost-effective distributed energy systems have been a challenge for most small communities. This project will demonstrate a Biomass Combined Heat and Power system in a rural community which uses a variety of distributed agricultural biomass as an alternative to burning coal and other fossil fuels. Vidir Biomass, the lead proponent, is developing a two-stage 2 MWth combustor which vitrifies the high silica content associated with straw. Vidir's partners in the project will further develop a low cost feedstock densification technology (biomass cubing) and also a proprietary thermodynamic power cycle to produce hot water and electrical power to demonstrate a district heating system for rural communities.

Consortium Members

Vidir Biomass Inc.
 Entropic Energy Inc.
 Prairie Bio Energy Inc.
 Community of Saint Laurent
 Manitoba Hydro
 University of Manitoba

3G Energy Corp.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$5,501,000

SDTC Funding:

\$1,834,000

Leveraged Funding:

\$3,667,000**Slip Form Concrete Wind Tower Project**

The current practice of installing wind turbines on steel towers involves the use of massive mobile cranes. This practice is becoming a limiting factor in the deployment of wind farms in Canada – especially in small installations and remote communities where crane use is very expensive or not even possible. This project will demonstrate a self-erecting 100 metre concrete tower for wind turbines using a slip-forming concrete pouring technique. The turbine components will be lifted to the top using a special gantry crane system built into the tower.

Consortium Members

3G Energy Corp.
 FWS Group
 Vensys Energiesysteme GmbH & Co KG
 Frontier Power Systems Inc.

6N Silicon Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$14,451,056

SDTC Funding:

\$4,074,505

Leveraged Funding:

\$10,376,551**A Proprietary Process for Purifying Metallurgical Grade Silicon Into Solar Grade Silicon Using Low Cost Metallurgical Processing**

6N's proprietary low-cost silicon purification process provides a revolutionary approach to the production of solar grade silicon for the photovoltaic industry. By converting cheap, readily available metallurgical grade silicon directly into solar-grade silicon, 6N is able to avoid the chemically-intensive and expensive process employed by the semiconductor industry. By significantly reducing the cost and energy consumed to purify the principal material used in the manufacturing of crystalline photovoltaic cells, the project aims to help speed up the adoption and growth of photovoltaic power.

Consortium Members

6N Silicon Inc.
 McMaster University
 EnCana Corp.

Advanced Lithium Power Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$4,400,000

SDTC Funding:

\$1,400,000

Leveraged Funding:

\$3,000,000**HEV Battery Packs**

Automotive manufacturers have identified advanced lithium-ion batteries as a strong technology of choice for hybrid electric vehicles and plug-in hybrid electric vehicles. Lithium-ion batteries have twice the energy and power density of current nickel-metal hydride batteries, half the size and weight, and are expected to be lower cost. Advanced Lithium Power has developed and integrated a complete lithium-ion battery system into a current model hybrid vehicle. This project is intended to advance the company's existing prototype battery results by building, testing, and demonstrating a production-ready battery pack to automotive manufacturers.

Consortium Members

Advanced Lithium Power Inc.

Quantum Fuel Systems Technologies
Worldwide Inc.

E-One Moli (Canada) Ltd.

AgroTerra Biotech Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Water

Total Project Value:

\$2,440,000

SDTC Funding:

\$800,000

Leveraged Funding:

\$1,640,000**Enzyme Replacement of Chemical Effluents in the Pulp and Paper Industry**

Several of the processes used in the pulp and paper industry to break down wood are problematic because toxic pollutants are released in waste water. AgroTerra Biotech and their consortium members have developed two enzymes which can withstand the harsh environment of pulp & paper processes and replace up to 30 % of the chemicals used. The consortium intends to demonstrate both the technical and commercial efficacy of these enzymes at a pilot scale. These processes could benefit from reductions in GHGs, operating costs, and effluent dilution water.

Consortium Members

AgroTerra Biotech Inc.

Innu-Science Canada

Buckman Laboratories

Kruger Inc.

Altek Power Corp.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$8,730,000

SDTC Funding:

\$2,910,000

Leveraged Funding:

\$5,820,000**Versatile System for Gas Turbine Alternative Fuel Power Generation**

Multi-fuel powered turbine engines are important for distributed power generation, especially for industries which accumulate large quantities of biomass waste. Given the diversity in available biomass wastes, it has been uneconomical to build a separate turbine suitable to each fuel type. The Altek Power consortium plans to demonstrate their interchangeable external silo combustors and new blade coatings to enable the use of a wide range of biomass feedstocks in a standard Altek turbine, thereby making biomass-fueled power generation economically viable.

Consortium Members

Altek Power Corp.

Enerkem Technologies Inc.

Magellan Aerospace Ltd.

Mashproekt Zorya

National Research Council

Pyromax Inc.

Ensyn Technologies Inc.

Biogénie S.R.D.C. inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air / Clean Soil

Total Project Value:

\$5,265,516

SDTC Funding:

\$1,618,948

Leveraged Funding:

\$3,646,568**Development of a Multi-Technology Soil Treatment Facility (MTSTF)**

EnGlobe Corp.'s wholly owned subsidiary Biogénie SRDC Inc. will develop a multi-technology soil treatment facility which will integrate a number of innovative, adapted, and developed processes for the treatment of contaminated soil, sludge, and sediment. This will improve the performance, capacity, and versatility of treatment facilities, allowing them to remediate larger quantities of more diversified and heavily contaminated material, and reduce the use of non-renewable resources.

Consortium Members

Biogénie S.R.D.C. inc.
 Biorem Technologies Inc.
 Petro-Canada
 Petrozyme Technologies Inc.
 Solution Eau Air Sol Inc.

CVT Corp.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$6,469,424

SDTC Funding:

\$2,134,910

Leveraged Funding:

\$4,334,514**Demonstration of a Pre-Commercial Toroidal-Based CVT on Heavy Agricultural Off-Road Vehicles**

Continuously Variable Transmissions (CVTs), while starting to appear in the automotive market due to improved efficiency over conventional geared transmissions, have not been adopted in heavy duty vehicles to date due to the mechanical strain imposed by the high torque associated with these vehicles. CVT Corp. has developed a high efficiency toroidal CVT suitable for the heavy-duty vehicle market. CVT Corp.'s system will be tested on a tractor, and should dramatically reduce fuel consumption (as much as 25%) as well as the amount of air contaminants produced.

Consortium Members

CVT Corp.
 Atelier d'usinage Côté & Audet inc.
 Case New Holland America LLC

Early Warning Inc.

Round 10-2006B

Environmental benefits: Clean Air / Clean Water / Clean Soil

Total Project Value:

\$7,276,360

SDTC Funding:

\$2,297,823

Leveraged Funding:

\$4,978,537**Biothreat Early Warning System**

A key to preventing waterborne outbreaks of dangerous microbial pathogens that cause sickness and death (such as E.coli) is frequent and comprehensive testing. The Biothreat Early Warning System applies a nanotechnology-based biosensor to automatically test for up to 100 specific pathogens in less than 30 minutes, any where, and at any time without the use of a laboratory, technicians, or expensive equipment. The consortium plans to demonstrate that a fully automated system will enable water agencies, testing firms, food processors, industrial plants, hospitals, and tourism establishments to detect and contain pathogens before outbreaks can occur.

Consortium Members

Early Warning Inc.
 Conestoga-Rovers & Associates –
 GAP EnviroMicrobial Services Division
 National Aeronautics and Space
 Administration
 State of Utah Center of Excellence for
 Biomedical Microfluidics
 University of Waterloo

Fifth Light Technology Ltd.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$11,677,000

SDTC Funding:

\$3,900,000

Leveraged Funding:

\$7,777,000**Lighting Management Control System II**

Building on its success of over 60% energy savings with its fluorescent light dimming system, Fifth Light Technologies and its consortium plan to extend their lighting management technology to lighting fixtures such as high intensity discharge and compact fluorescent lamps. This technology is intended to enable the building owner or occupant to control their energy costs, reduce their environmental footprint and participate in demand response programs.

Consortium Members

Fifth Light Technology Ltd.

Carleton University

Ellis Don Corp.

Marnoch Energy & Electrical Services Inc.

Ozz Corp.

Toronto Hydro Energy Services Inc.

HTC Hydrogen Technologies Corp.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$3,687,500

SDTC Funding:

\$1,090,000

Leveraged Funding:

\$2,597,500**Multi-feedstock Pre-commercial Hydrogen Production Demonstration Plant**

Glycerol is a resultant by-product from biodiesel production. As production of biodiesel grows, the amount of glycerol produced is expected to flood the existing commodity markets. HTC plans to build the first multi-feedstock hydrogen production demonstration project to reform bio-feedstock material such as glycerol into hydrogen. The process is designed to be scaleable from very small to very large plants—with an aim to solve the long standing transportation and storage cost barriers to hydrogen market growth.

Consortium Members

HTC Hydrogen Technologies Corp.

Dumur Industries

HTC Purenergy

Milligan Bio-Tech Inc.

Pinnacle Industrial Services

Pound-Maker AgVentures Ltd.

University of Regina/International Test Centre for CO₂ Capture

Middle Bay Sustainable Aquaculture Institute

Round 10-2006B

Environmental benefits: Clean Water / Clean Soil

Total Project Value:

\$7,153,500

SDTC Funding:

\$2,361,000

Leveraged Funding:

\$4,792,500**Floating Solid Wall Containment System**

The Middle Bay Sustainable Aquaculture Institute project will further explore and demonstrate the use of commercial-scale solid wall containment systems incorporating waste recovery, for salmon aquaculture. This technology has the potential to increase the rearing capacity of the Canadian and global salmon farming industry, by allowing for sustainable aquaculture growth in coastal communities while minimizing interference with marine environments.

Consortium Members

Middle Bay Sustainable Aquaculture Institute

AgriMarine Industries Inc.

Gordon and Betty Moore Foundation

Middle Bay Ltd. Partnership

Middle Bay Properties Inc.

Nova Scotia Power Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air / Clean Water

Total Project Value:

\$11,700,000

SDTC Funding:

\$4,650,000

Leveraged Funding:

\$7,050,000**Nova Scotia In-Stream Tidal Generation Project**

The Nova Scotia In-Stream Tidal Generation Project is proposing the installation of an in-stream tidal power generation facility in the Bay of Fundy, home to some of the strongest tidal currents in the world. In-stream tidal technology uses the energy present in the tidal currents to turn a turbine to generate electricity. The project will conduct comprehensive environmental and oceanographic monitoring, physical and electrical data logging, and operational assessment of a 1 MW tidal turbine connected via undersea cable to the electrical transmission grid.

Consortium Members

Nova Scotia Power Inc.

Acadia University

Department of Fisheries and Oceans
Centre for Ocean Model Development
and Application at Bedford Institute of
Oceanography

OpenHydro Group Ltd.

NxtGen Emission Controls Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$8,461,685

SDTC Funding:

\$2,516,882

Leveraged Funding:

\$5,944,803**Mobile Diesel Emission Reduction System**

NxtGen Emission Controls is developing the next generation in diesel emission reduction technology using hydrogen produced from diesel fuel and engine exhaust to reduce particulate matter and Nitrogen Oxides emissions, while enabling engine manufacturers to increase fuel economy. NxtGen's components can be retrofitted onto existing diesel trucks or factory installed on new vehicles. The project involves retrofitting the emission reduction system onto medium and heavy-duty commercial trucks to validate performance and durability in daily over-the-road operation.

Consortium Members

NxtGen Emission Controls Inc.

Engine Control Systems Inc.

SiREM Canada

Round 10-2006B

Environmental benefits: Climate Change / Clean Water / Clean Soil

Total Project Value:

\$1,906,300

SDTC Funding:

\$624,500

Leveraged Funding:

\$1,281,800**Bioaugmentation Demonstration with KB-1®**

SiREM will demonstrate the first Canadian application of KB-1® for in situ biodegradation of chlorinated solvents in cold groundwater and fractured bedrock conditions. Tetrachloroethene (PCE) and trichloroethene (TCE) are among the most commonly detected soil and groundwater contaminants. To date, other microbial approaches to treating these solvents have had limited success. KB-1® biodegrades these toxic solvents into non-toxic ethene. This demonstration is intended to show that bioaugmentation with KB-1® can be a cost-effective cleanup strategy for PCE and TCE contaminated sites, particularly under Canadian climatic and fractured bedrock site conditions.

Consortium Members

SiREM Canada

Magellan Aerospace Corp.

University of Toronto, Department of
Chemical Engineering and Applied
Chemistry

Sonic Environmental Solutions Inc.

Round 10-2006B

Environmental benefits: Clean Air / Clean Water / Clean Soil

Total Project Value:

\$2,322,313

SDTC Funding:

\$774,104

Leveraged Funding:

\$1,548,209**Demonstrate Sonoprocess™ Destruction of PCB from Contaminated Soils and Water at the Toronto Waterfront**

Sonic will further develop its patented sonic generator – PCB Sonoprocess™ – designed to treat PCBs by a sodium reaction using sonic vibration energy to convert PCBs into salt and low grade fuel. PCBs are persistent organic pollutants that degrade very slowly and hence can find their way into the food chain. Sonic's process is a non-thermal mobile solution. This project proposes to demonstrate the cost-effective treatment of PCBs both in contaminated ground water and in a solvent generated from a soil remediation process.

Consortium Members

Sonic Environmental Solutions Inc.

Maxxam Analytics Inc.

Ontario Realty Corp.

Sacré-Davey Innovations Inc.

City of Toronto Economic Development Corp.

Terragon Environmental Technologies Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air / Clean Water / Clean Soil

Total Project Value:

\$5,011,399

SDTC Funding:

\$1,592,500

Leveraged Funding:

\$3,418,899**Demonstration of the Micro Auto Gasification System (MAGS)**

Environmental and public health concerns have been mounting in northern communities, tourist resorts, and various enterprises due to the increasing challenges in dealing with waste. Terragon has responded to this problem by developing a Micro Auto Gasification System designed to convert mixed waste into carbonaceous ash and a clean gas fuel which can be used to power the waste treatment system and provide additional energy to the user. Terragon will demonstrate its technology in a remote community, a tourist resort, on a naval ship, as well as at its own facilities.

Consortium Members

Terragon Environmental Technologies

Boehringer Ingelheim (Canada) Ltd.

Department of National Defence
Canada (Canadian Navy)

Fairmont Le Château Montebello

Pituvik Landholding Corp.

U.S. Office of Naval Research

TM4 Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$6,629,565

SDTC Funding:

\$2,187,756

Leveraged Funding:

\$4,441,809**TM4's 3 MW Permanent Magnet Generator**

Two key issues facing the wind industry are managing the power-to-weight ratio as turbine size and tower height rises and the high failure rate of mechanical drive trains. TM4 is applying their existing permanent magnet wheel motor electrodynamic machine technology to a mid-size Permanent Magnet Generator. They are demonstrating the advantages of their technology, which features high power density and high efficiency over a wide range of operating speeds. The goal is to reduce total generator weight by at least 50% and volume by 30%, compared to conventional double-fed induction generators. This enables taller, less expensive towers and nacelles, resulting in a wind turbine that can deliver a greater power output.

Consortium Members

TM4 Inc.

Clipper Windpower Inc.

Turbo Trac Systems ULC Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$4,201,622

SDTC Funding:

\$1,032,379

Leveraged Funding:

\$3,169,243**Demonstration of CVT System in Industrial Applications**

Continuously Variable Transmissions, though available in light vehicle applications, have not been reliable in high torque applications such as oil pumps. Turbo Trac's technology is a mechanical "traction" device consisting of a number of metal cones, discs, and an epicyclical gear set. The device offers a split parallel power path that can handle the high varying torque and power demand of industry applications and heavy duty commercial vehicles. The project will test the technology on two different models of oil well pumps, first in Alberta and then in Texas.

Consortium Members

Turbo Trac Systems ULC Inc.

Lufkin Industries Inc.

Centre technologique en aérospatiale

Mecachrome Technologies Inc.

Novacam Technologies Inc.

Woodland Biofuels Inc.

Round 10-2006B

Environmental benefits: Climate Change / Clean Water / Clean Soil

Total Project Value:

\$36,045,590

SDTC Funding:

\$9,790,000

Leveraged Funding:

\$26,255,590**Biomass to Ethanol Demonstration Project**

Woodland Biofuels and its partners will build a unique industrial demonstration facility to efficiently produce cellulosic ethanol from wood waste using Woodland's patented Catalyzed Pressure Reduction™ technology, which also can be used to convert a broad range of renewable biomass materials into sustainable fuels. The project will field test the new integrated system equipment, determine energy consumption/operating costs, and prove the technology's efficiency. A steam blown gasifier will produce syngas for cleaning and catalytic conversion to ethanol. Waste heat from the plant will also eliminate the need to use 19,000,000 litres per year of Bunker C oil at a neighbouring paper recycling plant.

Consortium Members

Woodland Biofuels Inc.

Minas Basin Pulp and Power Co. Ltd.

Thermo Design Engineering Ltd.

Biothermica Technologies Inc.

Round 9-2006A

Environmental benefits: Climate Change / Clean Air / Clean Soil

Total Project Value:

\$6,623,549

SDTC Funding:

\$2,185,771

Leveraged Funding:

\$4,437,778**Biomass Gassification 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, Service de gestion de l'énergie inc.

SNC-Lavalin Environnement inc.

Biothermica Énergie inc.

CCR Technologies Ltd.

Round 9-2006A

Environmental benefits: Climate Change / Clean Air / Clean Soil

Total Project Value:	Removal of H2S from Gas Streams
\$3,731,720	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
SDTC Funding:	
\$1,190,420	
Leveraged Funding:	
\$2,541,300	

Consortium Members

CCR Technologies Ltd.
 Alberta Research Council
 National Research Council
 Canadian Centre for Environmental Technology Advancement (CETAC) - West
 Synergas Inc.
 Canadian Natural Resources Ltd.
 EnCana Corp.
 Glencoe Resources Ltd.

Dynamic Systems Inc.

Round 9-2006A

Environmental benefits: Climate Change / Clean Air

Total Project Value:	Transmission-less Hybrid Drive System
\$15,195,399	Dynamic Systems (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%.
SDTC Funding:	
\$4,258,800	
Leveraged Funding:	
\$10,936,599	

Consortium Members

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

E.I. du Pont Canada Company

Round 9-2006A

Environmental benefits: Climate Change / Clean Air / Clean Soil

Total Project Value:	KEVLAR® Engineered Elastomer for Tire Treads
\$3,207,840	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% improvement in tread wear and a 10% reduction in rolling resistance of vehicle tires thus increasing fuel efficiency.
SDTC Funding:	
\$1,058,587	
Leveraged Funding:	
\$2,149,253	

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:

\$7,480,386

SDTC Funding:

\$2,660,476

Leveraged Funding:

\$4,819,910**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.

GreenField Ethanol of Quebec Inc.

Tred'Si Inc.

Le Ministère des Ressources naturelles
et de la Faune du Québec

Dr. Camil Klier

General Electric Canada

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, and 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

BC Hydro

VRB Power Systems Inc.

General Electric Multlin

Powertech Labs Inc.

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% 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 Campell 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 reduces 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.
 Canadian Environment Technology Advancement Centre (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.
 Donald J. Ross Enterprise Ltd.
 Torsion Tec
 Hissarlik Design
 National Research Council
 Dale George
 Maritime Applied Physics Corp. (MAPC)
 Golder & Associates Inc.
 Atkins and Pearce Inc.
 TCOM L.P.
 VIGYAN Inc.

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 Corp. 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**

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% 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.

Zenon Membrane Solutions

Round 9-2006A

Environmental benefits: Climate Change / Clean Water

Total Project Value:

\$6,184,407

SDTC Funding:

\$2,316,556

Leveraged Funding:

\$3,867,851**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

Zenon Membrane Solutions

Regional Municipality of Peel

University of Guelph

Pro Aqua + Shadrack Inc.

Advanced Bio-Refinery 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 Inc. (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 and product energy and chemical values.

Consortium Members

Advanced Bio-Refinery Inc.

St. Marys Paper Ltd.

Tembec Inc.

Orenda Aerospace Corp.

Ontario Ministry of Natural Resources

CANMET Energy Technology Centre
(Natural Resources Canada)

ARISE Technologies Corp.

Round 8-2005B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$19,631,211

SDTC Funding:

\$6,439,037

Leveraged Funding:

\$13,192,174**Silicon Feedstock Pilot Plant Project**

ARISE Technologies Corp. 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 (plant material)**

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:

\$7,741,534

SDTC Funding:

\$2,500,000

Leveraged Funding:

\$5,241,534**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

American Leistritz Extruder Corp.

IPL Inc.

Chinook Mobile Heating & Deicing Corp.

Round 8-2005B

Environmental benefits: Climate Change / Clean Water / Clean Soil

Total Project Value:

\$5,728,125

SDTC Funding:

\$1,909,375

Leveraged Funding:

\$3,818,750**Tempered Steam Technology for Aircraft Defrosting & Deicing**

Chinook Mobile Heating and Deicing 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 winter operations.

Consortium Members

Chinook Mobile Heating & Deicing Corp.

Hovey Manufacturing

EcoVu Analytics

Round 8-2005B

Environmental benefits: Clean Water

Total Project Value:

\$2,388,712

SDTC Funding:

\$788,275

Leveraged 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.

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.

Consortium Members

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

Hydrogenics Corp.

Round 8-2005B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$16,281,107

SDTC Funding:

\$5,372,765

Leveraged Funding:

\$10,908,342**Fuel Cell-Powered Forklift Project**

Hydrogenics Corp., 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 Ltd.
 NACCO Materials Handling Group Inc.

Maritime Innovation

Round 8-2005B

Environmental benefits: Clean Water

Total Project Value:

\$2,533,311

SDTC Funding:

\$979,800

Leveraged Funding:

\$1,553,511**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 ballast 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 du Québec à Rimouski
 (UQAR)

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

Mechtronix Systems Inc. (formerly Ferti-Val Inc.)

Round 8-2005B

Environmental benefits: Climate Change / Clean Water / Clean Soil

Total Project Value:

\$5,636,816

SDTC Funding:

\$1,860,149

Leveraged Funding:

\$3,776,667**Demonstration of the Valoris™ Sludge Treatment System.**

Mechtronix Systems 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 sector.

Consortium Members

Mechtronix Systems Inc.
 City of Edmonton
 Edmonton Waste Management Centre
 of Excellence

New Energy Corp. 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 Corp. 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 currents 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 Corp. Inc.
Canoe Pass Tidal Energy Corp.
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 Nutriloc™ 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.
Global Minds Inc.

Ostara Nutrient Recovery Technologies Inc.

Round 8-2005B

Environmental benefits: Climate Change / Clean Air / Clean Water / Clean Soil

Total Project Value:

\$1,744,611

SDTC Funding:

\$375,760

Leveraged 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
Stantec Inc.
NORAM Engineering and Constructors Ltd.
Maple Reinders Constructors Ltd.

Peacock Industries

Round 8-2005B

Environmental benefits: Climate Change / Clean Water / Clean Soil

Total Project Value:

\$3,987,000

SDTC Funding:

\$1,248,126

Leveraged Funding:

\$2,738,874**Reduction of Soil, Water and Air Contamination by Replacing Toxic Pesticides and Fertilizers with the New Mustard Products: Bio-pesticides and Bio-diesel**

Peacock Industries Inc. and its consortium aim to co-produce an environmentally-friendly organic bio-pesticide and methyl ester (used to produce biodiesel) 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 biodiesel production will help improve air quality, reduce mineral oil consumption and engine wear, and improve fuel mileage.

Consortium Members

Peacock Industries
 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 (formerly Crompton Corp.)
 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:

\$7,558,820

SDTC Funding:

\$2,500,000

Leveraged Funding:

\$5,058,820**Enterprise 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 Management Corp.
 Milwest Holdings Inc., Data Base File Tech Group
 Schneider Electric Ltd.

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% can be achieved.

Consortium Members

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

The Pressure Pipe Inspection Company Ltd.

Round 8-2005B

Environmental benefits: Clean Water / Clean Soil

Total Project Value:

\$1,290,691

SDTC Funding:

\$400,000

Leveraged Funding:

\$890,691**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 is 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 Ltd.
C-Core
Halifax Regional Water Commission
Hyprescon Inc.
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 and, through the recycling of process water, reduce energy requirements and 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 Ltd.

Unicell Ltd.

Round 8-2005B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$9,908,097

SDTC Funding:

\$2,110,000

Leveraged Funding:

\$7,798,097**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%. 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.

Meritor Heavy Vehicle Systems LLC

Electrovaya Corp.

Purolator Courier Ltd.

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 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 from landfills.

Consortium Members

AirScience Technologies Inc.

Municipality of Dolbeau, Que./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:

\$9,505,504

SDTC Funding:

\$2,300,000

Leveraged 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 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 (Sinnett)
 Ag-West Bio Inc.
 Saskatchewan Power Corp. (SaskPower)
 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:

\$8,590,578

SDTC Funding:

\$2,834,891

Leveraged 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 Énergie 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:

\$3,828,862

SDTC Funding:

\$1,866,630

Leveraged Funding:

\$1,962,232**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 Inc.
 University of Calgary (Civil Engineering)
 Read Jones Christoffersen Ltd.
 Greater Vancouver Regional District (GVRD)
 Public Works and Government Services Canada (PWGSC)
 Halcrow Yolles
 Holcim (U.S.) Inc.
 AMEC Earth and Environmental Ltd.
 British Columbia Institute of Technology (BCIT)
 Busby, Perkins and Will Architects Co.
 C&CS Atlantic Inc.
 Canadian Steel Producers Association
 EBA Engineering Consultants Ltd.
 Environnement Canada
 Graham Group Ltd.
 Groupe SEM (SIMCO Technologies Inc.)
 Lehigh Northwest Cement Ltd.
 Levelton Consultants Ltd.
 University of Toronto (Civil Engineering)
 Windmills Development Group Ltd.

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: Climate Change / Clean Air / 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 Corp is demonstrating a 2,000-barrels-of-oil-per-day demonstration plant to field test a patented process (N-Solv™) for in-situ extraction of oil from oil sands using a pure condensing solvent. The process offers commercially attractive oil-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 Ltd.
(JACOS)

Netistix Technologies Corp.

Round 7-2005A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$1,388,441

SDTC Funding:

\$540,554

Leveraged Funding:

\$847,887**Netistix™ Emission Management System (NEMS)**

Netistix Technologies Corp. 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
CanadaNatural Resources Canada-Personal
Vehicles Initiative

Nexterra Energy Corp.

Round 7-2005A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$8,357,575

SDTC Funding:

\$2,758,263

Leveraged 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)
Domtar Inc.
Natural Resources Canada - Efficiency and Alternative Energy Program
NRC - IRAP (Pacific)
Ethanol BC (Forintek Canada Corp.)

Outland Technologies Inc.

Round 7-2005A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$6,000,000

SDTC Funding:

\$2,000,000

Leveraged 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 Inc.

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 Inc. 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 Inc.
Canadian Natural Resources Ltd.
Husky Energy Inc.
Nexen Petroleum Canada

Plasco Trail Road Inc.

Round 7-2005A

Environmental benefits: Climate Change / Clean Air / Clean Water

Total Project Value:

\$30,626,918

SDTC Funding:

\$9,494,466

Leveraged Funding:

\$21,132,452**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 Trail Road 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:

\$5,142,401

SDTC Funding:

\$1,716,000

Leveraged Funding:

\$3,426,401**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 Ltd.
Acura Embedded Systems Inc.
Public Works and Governmental Services Canada (PWGSC)

Solar Hydrogen Energy Corp. (SHEC Labs)

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

Solar Hydrogen Energy Corp. (SHEC Labs)
Giffels Associates Ltd. (An Ingenium Group Company)
SaskEnergy Inc.
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 which 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.
EnCana Corp.-EEIF
GreenField Ethanol Inc.

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 Corp.

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 Corp.
Amec Americas Ltd.
Amec Dynamic Structures Ltd.
Lester B. Pearson College of the Pacific
Ocean Works International
Powertech Labs Inc.
Triton Consultants Ltd.

Electrovaya Corp.

Round 6-2004B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$4,973,062

SDTC Funding:

\$1,641,110

Leveraged Funding:

\$3,331,952**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 Ltd.

SouthWestern Energy Inc.

Halton Hills Hydro Inc.

Purolator Courier Ltd.

Group IV Semiconductor Inc.

Round 6-2004B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$6,740,281

SDTC Funding:

\$2,145,000

Leveraged Funding:

\$4,595,281**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

Canadian Photonics Fabrication Centre (NRC)

Carleton University, Faculty of Engineering

EnCana Corp.

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

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: Climate Change / Clean Air

Total Project Value:

\$17,565,575

SDTC Funding:

\$5,624,850

Leveraged Funding:

\$11,940,725**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, CO, 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
Hamilton Sundstrand Corp.
United Technologies Research Center
INCO Ltd.

Science Applications International Corp.
(SAIC Canada)

Round 6-2004B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$2,143,000

SDTC Funding:

\$707,000

Leveraged Funding:

\$1,436,000**Demonstration of the Use of Aquifer Thermal Energy Storage (ATES) for Seasonal Cooling**

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. This portion of the project, using an Aquifer Thermal Energy Storage (ATES) system for seasonal heating and cooling, will be demonstrated in a commercial condominium complex in Medicine Hat, Alberta. The initial part of this project using a Borehole Thermal Energy Storage (BTES) system has been completed and is reported in Section 5 – Completed Projects.

Consortium Members

Science Applications International Corp. (SAIC Canada)
Climate Change Central/Energy Solutions Alberta (Prov. Of Alberta)
IF Technology International
City of Medicine Hat

University of British Columbia

Round 6-2004B

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$7,299,098

SDTC Funding:

\$2,408,702

Leveraged Funding:

\$4,890,396**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
 Stantec Consulting Inc.
 Busby, Perkins and Will Architects Co.
 British Columbia Institute of Technology
 Photovoltaics Technology Centre
 Visionwall Corp.
 Honeywell Inc. (Automation Systems & Controls)

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 Corp.
 Hydro-Québec CapiTech Inc.
 University of Toronto, Forestry Department

Atlantic Hydrogen Inc. (formerly Precision H2)

Round 5-2004A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$6,764,348

SDTC Funding:

\$2,096,948

Leveraged Funding:

\$4,667,400**CARBOSAVER™: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 refuelling 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
 Agriculture and Agri-Food 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.

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.

AltaGas Income Trust Ltd.

Vantage Engineering Inc.

Colleaux Engineering Inc.

Gameau inc.

Tenova Goodfellow Inc.

(formerly Techint & Stantec Global Technologies)

Round 5-2004A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$13,193,157

SDTC Funding:

\$3,957,947

Leveraged Funding:

\$9,235,210**Development and Demonstration of Goodfellow EFSOP™ Technology**

Tenova Goodfellow 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

Tenova Goodfellow Inc.

Unisearch Associates Inc.

University of Toronto

The Ontario Centre for Environmental Technology Advancement (OCETA)

Hamilton Works U.S. Steel Canada

St. Mary's Cement Inc.

Ontario Power Generation Inc.
(Northwest Division)

Xantrex Technology Inc.

Round 5-2004A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$13,470,793

SDTC Funding:

\$4,445,362

Leveraged Funding:

\$9,025,431**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, 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

DeCloet Greenhouse Mfg. 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%, 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 Mfg. 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	Microprocessor Based Dimmer Technology for Fluorescent Lights Driven by Magnetic Ballasts
SDTC Funding: \$3,036,000	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. At a time of heightened concern over rising energy costs and greenhouse gas emissions, it's ironic that most commercial spaces are over-lit, while building tenants generally prefer lower light levels than are available to them. 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.
Leveraged Funding: \$6,164,000	

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	Recovery of Bitumen and Naptha, from Oil Tailing Streams & Tailing Ponds
SDTC Funding: \$5,000,000	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.
Leveraged Funding: \$20,322,000	

Consortium Members

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

Lignol Innovations Corp.

Round 4-2003B

Environmental benefits: Climate Change / Clean Air

Total Project Value: \$13,277,649	Lignol Biomass Conversion Technology
SDTC Funding: \$4,421,457	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.
Leveraged Funding: \$8,856,192	

Consortium Members

Lignol Innovations Corp.
University of British Columbia, Faculty of Forestry
Ainsworth Lumber
NRC - IRAP
Michael Ainsworth
West Fraser Timber Co. Ltd.
Suncor Energy Products Inc.
Alberta Government – Department of Energy
Ethanol BC

NxtPhase T&D Corp.

Round 4-2003B

Environmental benefits: Climate Change

Total Project Value: \$3,226,542	Optical Voltage and Current sensor Cost Reduction and Field Demonstration
SDTC Funding: \$986,220	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.
Leveraged Funding: \$2,240,322	

Consortium Members

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

Sacré-Davey Innovations Inc.

Round 4-2003B

Environmental benefits: Climate Change / Clean Air

Total Project Value: \$17,832,999	Integrated Waste Hydrogen Utilization Project (IWHUP)
SDTC Funding: \$5,879,000	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.
Leveraged Funding: \$11,953,999	

Consortium Members

Sacré-Davey Innovations Inc.
Westport Research Inc.
Clean Energy Fuels Canada
Hydrogen Technology and Energy Corp.
Greater Vancouver Transit Authority
dba Translink
Nuvera Fuel Cells
Easy-Wash Inc.
Dynetek Industries Ltd.
Powertech Labs Inc.
QuestAir Technologies Inc.
Natural Resources Canada – Canadian
Transport Fuel Cells alliance (CTFCA)
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.

(formerly Gen-X Power)

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 and 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 Ltd.

Canadian Centre for Pollution Prevention

Ontario Centre for Environment Technology Advancement (OCETA)

Bodycote Materials Testing Canada Inc.

SANI-FLO Welding Ltd.

GMP Engineering Ltd.

Quantiam Technologies Inc.

Round 3-2003A

Environmental benefits: Climate Change / Clean Air

Total Project Value:

\$9,844,819

SDTC Funding:

\$1,450,000

Leveraged Funding:

\$8,394,819**Catalyzed-Assisted Manufacture of Olefins and Hydrogen**

Quantiam Technology 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 Corp.

NOVA Research & Technology Corp.

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**

RailPowerTechnology 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 NOx. 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 Ltd.

Transport Canada-Freight Sustainability Demonstration Program

Saskatchewan Power Corp. (SaskPower)

Round 3-2003A

Environmental benefits: Clean Air

Total Project Value:

\$10,407,900

SDTC Funding:

\$3,182,900

Leveraged Funding:

\$7,225,000**Field Evaluation of Activated Carbon Injection to Control Mercury Emissions from Coal-Fired Power Plant**

SaskPower 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 providing a technical path to reduce GHGs.

Consortium Members

SaskPower

Alstom Canada Ltd.

Sherrit Coal (formerly Luscar Ltd.)

University of North Dakota Environmental and Energy Centre (UND-EERC)

Natural Resources Canada (CANMET Energy Technology Centre)

University of North Dakota Environmental and Energy Research Centre

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

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 Corp.

GSW Water Heating Company, a division of GSW Inc.

Natural Resources Canada (CANMET Energy Technology Centre)

Mechanical Systems 2000 Inc.

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 Microwaves- High Frequency (HF) for Sustainable Development**

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.

NORAM Engineering and Constructors Ltd.

University of New Brunswick

Round 2-2002B

Environmental benefits: Climate Change / Clean Air

Total Project Value:
\$725,510

SDTC Funding:
\$260,000

Leveraged Funding:
\$465,511

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.
Universite de Moncton
Wind Energy Institute of Canada
(Atlantic Wind Test Site)
Natural Resources Canada

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 stream at temperatures above 5° C 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.
Natural Resources Canada (CANMET
Energy Technology Centre)

Nova Chemicals Corp.

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 Corp.
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 (CSEMP)**

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 Corp.

MGV Energy Inc.

Alberta Energy Research Institute

Natural Resources Canada (TEAM & PERD)

TransCanada Pipelines Ltd.

Alberta Research Council

Enerplus Resources Corp.

Penn West Petroleum Ltd.

Air Liquide Canada Inc.

University of Calgary

Alberta Science and Research Authority

SD Tech Fund™ Portfolio Approved Project Funding Summary

Active Projects

*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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
Round 11- 2007A											
Biothermica Technologies Inc.*	\$ 513,836	33.0%	\$ 543,244	34.9%	\$ 500,000	32.1%	\$ 1,557,080	CC			
Corporation HET - Horizon Environnement Technologies*	\$ 1,186,316	33.0%	\$ 1,908,582	53.1%	\$ 500,000	13.9%	\$ 3,594,898	CC		CW	CS
Développement Effenco inc.*	\$ 465,166	33.5%	\$ 795,350	57.2%	\$ 130,000	9.3%	\$ 1,390,516	CC	CA		
EnQuest Power Corp.*	\$ 3,302,500	25.3%	\$ 9,730,766	74.7%	-	0.0%	\$ 13,033,266	CC	CA	CW	CS
EnviroTower Inc.*	\$ 730,534	32.0%	\$ 1,552,384	68.0%	-	0.0%	\$ 2,282,918	CC		CW	
Ferrinov Inc.*	\$ 1,864,334	33.0%	\$ 3,450,000	61.0%	\$ 338,000	6.0%	\$ 5,652,334	CC	CA		CS
General Electric Canada*	\$ 7,307,000	33.3%	\$ 14,615,000	66.7%	-	0.0%	\$ 21,922,000	CC	CA		
HSM Systems Inc.*	\$ 1,402,750	32.9%	\$ 2,487,250	58.4%	\$ 370,000	8.7%	\$ 4,260,000	CC	CA		
Menova Energy Inc.*	\$ 2,684,000	33.4%	\$ 5,353,000	66.6%	-	0.0%	\$ 8,037,000	CC	CA		
MSR Innovations Inc.*	\$ 371,998	33.3%	\$ 643,998	57.7%	\$ 100,000	9.0%	\$ 1,115,996	CC	CA		
St-Jean Photochemicals*	\$ 1,637,656	32.7%	\$ 1,255,224	25.1%	\$ 2,113,227	42.2%	\$ 5,006,107	CC	CA		CS
TM4 Inc.*	\$ 3,818,787	33.0%	\$ 7,121,296	61.5%	\$ 632,000	5.5%	\$ 11,572,083	CC	CA		
Trilogics Technologies Inc.*	\$ 400,000	28.1%	\$ 1,025,000	71.9%	-	0.0%	\$ 1,425,000		CA	CW	CS
Vidir Biomass Inc.*	\$ 4,570,000	36.1%	\$ 3,961,000	31.3%	\$ 4,127,000	32.6%	\$ 12,658,000	CC	CA		CS
Round 10-2006B											
3G Energy Corp.*	\$ 1,834,000	33.3%	\$ 3,667,000	66.7%	-	0.0%	\$ 5,501,000	CC	CA		
6N Silicon Inc.	\$ 4,074,505	28.2%	\$ 6,876,551	47.6%	\$ 3,500,000	24.2%	\$ 14,451,056	CC	CA		
Advanced Lithium Power Inc.*	\$ 1,400,000	31.8%	\$ 2,600,000	59.1%	\$ 400,000	9.1%	\$ 4,400,000	CC	CA		
AgroTerra Biotech Inc.*	\$ 800,000	32.8%	\$ 1,340,000	54.9%	\$ 300,000	12.3%	\$ 2,440,000	CC		CW	

*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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
Altek Power Corp.*	\$ 2,910,000	33.3%	\$ 3,590,000	41.1%	\$ 2,230,000	25.5%	\$ 8,730,000	CC	CA		
Biogénie S.R.D.C. inc.	\$ 1,618,948	30.7%	\$ 3,646,568	69.3%	-	0.0%	\$ 5,265,516	CC	CA		CS
CVT Corp.*	\$ 2,134,910	33.0%	\$ 3,434,514	53.1%	\$ 900,000	13.9%	\$ 6,469,424	CC	CA		
Early Warning Inc.*	\$ 2,297,823	31.6%	\$ 2,336,537	32.1%	\$ 2,642,000	36.3%	\$ 7,276,360		CA	CW	CS
Fifth Light Technology Ltd.	\$ 3,900,000	33.4%	\$ 6,077,000	52.0%	\$ 1,700,000	14.6%	\$ 11,677,000	CC	CA		
HTC Hydrogen Technologies Corp.*	\$ 1,090,000	29.6%	\$ 1,155,500	31.3%	\$ 1,442,000	39.1%	\$ 3,687,500	CC	CA		
Middle Bay Sustainable Aquaculture Institute*	\$ 2,361,000	33.0%	\$ 4,792,500	67.0%	-	0.0%	\$ 7,153,500			CW	CS
Nova Scotia Power Inc.*	\$ 4,650,000	39.7%	\$ 4,670,000	39.9%	\$ 2,380,000	20.3%	\$ 11,700,000	CC	CA	CW	
NxtGen Emission Controls Inc.	\$ 2,516,882	29.7%	\$ 5,544,803	65.5%	\$ 400,000	4.7%	\$ 8,461,685	CC	CA		
SiREM Canada*	\$ 624,500	32.8%	\$ 1,281,800	67.2%	-	0.0%	\$ 1,906,300	CC		CW	CS
Sonic Environmental Solutions Inc.*	\$ 774,104	33.3%	\$ 1,548,209	66.7%	-	0.0%	\$ 2,322,313		CA	CW	CS
Terragon Environmental Technologies Inc.*	\$ 1,592,500	31.8%	\$ 2,274,903	45.4%	\$ 1,143,996	22.8%	\$ 5,011,399	CC	CA	CW	CS
TM4 Inc.*	\$ 2,187,756	33.0%	\$ 2,941,809	44.4%	\$ 1,500,000	22.6%	\$ 6,629,565	CC	CA		
Turbo Trac Systems ULC Inc.	\$ 1,032,379	24.6%	\$ 3,169,243	75.4%	-	0.0%	\$ 4,201,622	CC	CA		
Woodland Biofuels Inc..*	\$ 9,790,000	27.2%	\$ 26,255,590	72.8%	-	0.0%	\$ 36,045,590	CC		CW	CS
Round 9-2006A											
Biothermica Technologies Inc.	\$ 2,185,771	33.0%	\$ 2,837,778	42.8%	\$ 1,600,000	24.2%	\$ 6,623,549	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		
Enerkem Technologies Inc.	\$ 2,660,476	35.6%	\$ 2,894,910	38.7%	\$ 1,925,000	25.7%	\$ 7,480,386	CC	CA		
General Electric Canada*	\$ 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	

*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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
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	
Zenon Membrane Solutions	\$ 2,316,556	37.5%	\$ 3,740,901	60.5%	\$ 126,950	2.1%	\$ 6,184,407	CC		CW	
Round 8-2005B											
Advanced BioRefinery 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.	\$ 6,439,037	32.8%	\$ 13,192,174	67.2%	-	0.0%	\$ 19,631,211	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*	\$ 2,000,000	33.7%	\$ 3,932,500	66.3%	-	0.0%	\$ 5,932,500	CC	CA		
Cerestech Inc.	\$ 2,500,000	32.3%	\$ 4,741,534	61.2%	\$ 500,000	6.5%	\$ 7,741,534	CC		CW	
Chinook Mobile Heating and Deicing Inc.	\$ 1,909,375	33.3%	\$ 2,988,750	52.2%	\$ 830,000	14.5%	\$ 5,728,125	CC		CW	CS
EcoVu Analytics Inc.	\$ 788,275	33.0%	\$ 1,261,217	52.8%	\$ 339,220	14.2%	\$ 2,388,712			CW	
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%	\$ 10,908,342	67.0%	-	0.0%	\$ 16,281,107	CC	CA		
Maritime Innovation (IMAR)	\$ 979,800	38.7%	\$ 1,319,011	52.1%	\$ 234,500	9.3%	\$ 2,533,311			CW	
MCW Consultants Ltd.*	\$ 2,000,000	33.1%	\$ 3,887,000	64.4%	\$ 150,000	2.5%	\$ 6,037,000	CC	CA	CW	
Mechtronix Systems Inc.*	\$ 1,860,149	33.0%	\$ 3,192,917	56.6%	\$ 583,750	10.4%	\$ 5,636,816	CC		CW	CS
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	33.1%	\$ 4,808,820	63.6%	\$ 250,000	3.3%	\$ 7,558,820	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 Ltd.	\$ 400,000	31.0%	\$ 428,553	33.2%	\$ 462,138	35.8%	\$ 1,290,691			CW	CS
TSC Company Ltd.	\$ 5,000,000	18.7%	\$ 21,700,000	81.3%	-	0.0%	\$ 26,700,000	CC		CW	

*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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)					
Unicell Ltd.	\$ 2,110,000	21.3%	\$ 5,861,890	59.2%	\$ 1,936,207	19.5%	\$ 9,908,097	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.	\$ 1,866,630	48.8%	\$ 1,818,232	47.5%	\$ 144,000	3.8%	\$ 3,828,862	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	\$ 1,900,000	25.1%	\$ 5,271,799	69.6%	\$ 400,000	5.3%	\$ 7,571,799	CC	CA	CW			
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				
N-Solv Corp.	\$ 8,604,672	29.4%	\$ 20,678,608	70.6%	-	0.0%	\$ 29,283,280	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 Inc.	\$ 3,168,990	3.0%	\$ 5,854,010	61.0%	\$ 580,000	6.0%	\$ 9,603,000	CC	CA				
Plasco Trail Road Inc.	\$ 9,494,466	31.0%	\$ 12,808,452	41.8%	\$ 8,324,000	27.2%	\$ 30,626,918	CC	CA	CW			
Power Diagnostic Technologies Ltd.	\$ 1,716,000	33.4%	\$ 3,345,401	65.1%	\$ 81,000	1.6%	\$ 5,142,401	CC	CA				
SHEC Labs*	\$ 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				
Group IV Semi Conductor Inc.	\$ 2,145,000	31.8%	\$ 2,766,281	41.0%	\$ 1,829,000	27.1%	\$ 6,740,281	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	32.0%	\$ 11,940,724	68.0%	-	0.0%	\$ 17,565,575	CC	CA				
SAIC Canada	\$ 707,000	33.0%	\$ 363,000	16.9%	\$ 1,073,000	50.1%	\$ 2,143,000	CC	CA				
University of British Columbia	\$ 2,408,702	33.0%	\$ 3,776,993	51.7%	\$ 1,113,403	15.3%	\$ 7,299,098	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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
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.	\$ 2,096,948	31.0%	\$ 3,091,066	45.7%	\$ 1,576,334	23.3%	\$ 6,764,348	CC	CA		
Atlantic Packaging Products Ltd.	\$ 2,514,600	28.5%	\$ 6,322,117	71.5%	-	0.0%	\$ 8,836,717	CC	CA		CS
Great Northern Power Corp.	\$ 1,981,914	28.4%	\$ 5,006,200	71.6%	-	0.0%	\$ 6,988,114	CC	CA		
Tenova Goodfellow Inc.	\$ 3,957,947	30.0%	\$ 7,592,710	57.6%	\$ 1,642,500	12.4%	\$ 13,193,157	CC	CA		
Xantrex Technology Inc.	\$ 4,445,362	33.0%	\$ 9,025,430	67.0%	-	0.0%	\$ 13,470,792	CC	CA		
Round 4-2003B											
DeCloet Greenhouse Manufacturing Ltd.	\$ 569,082	33.0%	\$ 960,407	55.7%	\$ 195,000	11.3%	\$ 1,724,489	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 Ltd.	\$ 4,421,457	33.3%	\$ 7,711,572	58.1%	\$ 1,144,620	8.6%	\$ 13,277,649	CC	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			
Quantiam Technologies Inc.	\$ 1,450,000	14.7%	\$ 5,487,819	55.7%	\$ 2,907,000	29.5%	\$ 9,844,819	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.	\$ 3,182,900	30.6%	\$ 7,205,000	69.2%	\$ 20,000	0.2%	\$ 10,407,900		CA		
Round 2-2002B											
Ensyn Technologies Inc.	\$ 2,000,000	22.5%	\$ 3,295,871	37.0%	\$ 3,600,000	40.5%	\$ 8,895,871	CC	CA		
IBC Technologies Inc.	\$ 266,000	27.7%	\$ 677,580	70.6%	\$ 16,420	1.7%	\$ 960,000	CC	CA		
Radiant Technologies Inc.	\$ 1,000,000	18.2%	\$ 4,181,000	76.0%	\$ 319,000	5.8%	\$ 5,500,000	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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
University of New Brunswick	\$ 260,000	35.8%	\$ 323,054	44.5%	\$ 142,457	19.6%	\$ 725,511	CC	CA		
Round 1-2002A											
Mabarex Inc.	\$ 1,190,000	35.0%	\$ 1,960,000	57.6%	\$ 250,000	7.4%	\$ 3,400,000	CC	CA		
Suncor Energy Inc.	\$ 2,250,000	26.8%	\$ 3,891,371	46.4%	\$ 2,250,000	26.8%	\$ 8,391,371	CC			
Total	\$ 275,127,048	30.4%	\$ 515,909,609	56.9%	\$ 115,121,860	12.7%	\$ 906,157,515				

Completed Projects

*Amounts are based on actual disbursements at project completion

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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
Round 6-2004B											
SAIC Canada	\$ 1,009,589	20.8%	\$ 2,049,009	42.3%	\$ 1,787,958	36.9%	\$ 4,846,556	CC	CA		
Sunarc of Canada Inc.	\$ 553,719	30.0%	\$ 747,341	40.5%	\$ 543,327	29.5%	\$ 1,844,387	CC	CA		
M.A. Turbo/Engine Ltd.	\$ 152,844	46.0%	\$ 179,760	54.0%	-	0.0%	\$ 332,604		CA		
Round 4-2003B											
BIOX Canada Ltd.	\$ 5,000,000	14.6%	\$ 25,504,071	73.9%	\$ 4,000,000	11.6%	\$ 34,504,071	CC	CA		
Nanox inc.	\$ 1,800,000	40.3%	\$ 1,238,248	27.7%	\$ 1,425,000	31.9%	\$ 4,463,248		CA		
Round 3-2003A											
Hydrogenics Corp.	\$ 1,350,419	44.0%	\$ 1,327,716	43.3%	\$ 391,000	12.7%	\$ 3,069,135		CA		
Paradigm Environmental Technologies Inc.	\$ 250,000	20.7%	\$ 653,804	54.1%	\$ 305,000	25.2%	\$ 1,208,804	CC	CA	CW	
Plug Power Canada Inc.	\$ 2,000,000	22.2%	\$ 6,026,000	66.8%	\$ 1,000,000	11.1%	\$ 9,026,000		CA		

*Amounts are based on actual disbursements at project completion

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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
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
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
Mikro-Tek Inc.	\$ 500,400	14.4%	\$ 2,982,950	85.6%	-	0.0%	\$ 3,483,350	CC			CS
West Lorne Bio-Oil Co-Generation Ltd. 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.	\$ 1,000,000	17.0%	\$ 2,288,008	38.9%	\$ 2,593,550	44.1%	\$ 5,881,558	CC			
Westport Research Inc.	\$ 1,000,000	32.1%	\$ 1,565,376	50.2%	\$ 550,000	17.7%	\$ 3,115,376		CA		
Total	\$24,428,086	23.7%	\$ 62,824,716	61.0%	\$ 15,721,959	15.3 %	\$ 102,975,761				

Early Termination Projects

*Amounts are based on actual disbursement prior to termination

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 and Academia Funding	% of Total Eligible Project Costs	Total Eligible Project Costs	Environmental Benefits (Primary Benefits Bolded)			
Round 1 2002A											
NOVA Chemicals Corp.	\$ 320,000	22.7%	\$ 268,081	19.0%	\$ 820,000	58.2%	\$ 1,408,081	CC	CA		

Total Portfolio

Total	\$ 299,875,134	29.7%	\$ 579,002,406	57.3%	\$ 131,663,819	13.0%	\$ 1,010,541,357				
--------------	-----------------------	--------------	-----------------------	--------------	-----------------------	--------------	-------------------------	--	--	--	--

SD Tech Fund™ Project Classification

SDTC Approved Funding in Hydrogen Economy, Clean Fossil Fuels, Clean Water and Clean Soil Projects (as of December 31, 2007)

Hydrogen Economy Projects

Round	Lead Consortia Partner	Total Eligible Project Costs	SDTC Announced Funding
Round 11 - 2007A	HSM Systems Inc.*	\$ 4,260,000	\$ 1,402,750
Round 10 - 2006B	HTC Hydrogen Technologies Corp.*	\$ 3,687,500	\$ 1,090,000
Round 8 - 2005B	Hydrogenics Corp.	\$ 16,281,107	\$ 5,372,765
Round 7 - 2005A	AirScience Technologies, Inc.*	\$ 3,248,000	\$ 1,038,180
	Solar Hydrogen Energy Corp. (SHEC LABS)*	\$ 6,230,000	\$ 2,076,667
Round 6 - 2004B	Angstrom Power Inc.	\$ 1,263,271	\$ 444,436
Round 5 - 2004A	Atlantic Hydrogen Inc.	\$ 6,764,348	\$ 2,096,948
Round 4 - 2003B	Sacré-Davey Innovations Inc.	\$ 17,832,999	\$ 5,879,000
Round 3 - 2003A	Plug Power Canada Inc.	\$ 9,026,000	\$ 2,000,000
	Hydrogenics Corp.	\$ 3,069,135	\$ 1,350,419
10 Projects		\$ 71,662,360	\$ 22,751,165

Clean Fossil Fuel Projects

Round 11 - 2007A	Menova Energy Inc.*	\$ 8,037,000	\$ 2,684,000
Round 10 - 2006B	Turbo Trac Systems ULC Inc.	\$ 4,201,622	\$ 1,032,379
Round 9 - 2006A	CCR Technologies Ltd.*	\$ 3,731,720	\$ 1,190,420
Round 8 - 2005B	TSC Company Ltd.	\$ 26,700,000	\$ 5,000,000
Round 7 - 2005A	N-Solv Corp.	\$ 29,283,280	\$ 8,604,672
	Power Diagnostic Technologies Ltd.	\$ 5,142,401	\$ 1,716,000
	Petroleum Technology Research Centre Inc.	\$ 9,603,000	\$ 3,168,990
Round 4 - 2003B	Gradek Energy Inc.	\$ 25,322,000	\$ 5,000,000
	Synodon Inc.	\$ 2,623,788	\$ 650,000
Round 1 - 2002A	Suncor Energy Inc.	\$ 8,391,371	\$ 2,250,000
	CO ₂ Solution Inc.	\$ 5,881,558	\$ 1,000,000
11 Projects		\$ 128,917,740	\$ 32,296,461

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

Clean Water / Clean Soil Projects

Round 11 – 2007A	Trilogics Technologies Inc.*	\$	1,425,000	\$	400,000
	Corporation HET - Horizon Environnement Technologies*	\$	3,594,898	\$	1,186,316
	EnviroTower Inc.*	\$	2,282,918	\$	730,534
	Ferrinov Inc.*	\$	5,652,334	\$	1,864,334
Round 10 - 2006B	Middle Bay Sustainable Aquaculture Institute*	\$	7,153,500	\$	2,361,000
	SiREM Canada*	\$	1,906,300	\$	624,500
	AgroTerra Biotech Inc.*	\$	2,440,000	\$	800,000
	Early Warning Inc.*	\$	7,276,360	\$	2,297,823
	Terragon Environmental Technologies Inc.*	\$	5,011,399	\$	1,592,500
	Biogénie S.R.D.C. inc.	\$	5,265,516	\$	1,618,948
	Sonic Environmental Solutions Inc.*	\$	2,322,313	\$	774,104
Round 9 - 2006A	Zenon Membrane Solutions	\$	6,184,407	\$	2,316,556
	Industrial Catalytic Technologies Inc.*	\$	2,513,016	\$	829,295
Round 8 - 2005B	Chinook Mobile Heating & Deicing Corp.	\$	5,728,125	\$	1,909,375
	EcoVu Analytics	\$	2,388,712	\$	788,275
	Ostara Nutrient Recovery Technologies Inc.	\$	1,744,611	\$	375,760
	The Pressure Pipe Inspection Company Ltd.	\$	1,290,691	\$	400,000
	Maritime Innovation	\$	2,533,311	\$	979,800
18 Projects		\$	66,713,411	\$	21,849,120

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

Classification Allocation % to Climate Change and Clean Air

Of the SD Tech Fund's total value of \$550M, an amount of \$350M is to be designated for projects that have an environmental benefit that relates primarily to climate change (80%) and clean air (20%).

SDTC is on track to meet the above requirement with allocations to date as follows:

- 77% of the designated funds have been allocated to projects that address primarily climate change; and,
- 23% of the designated funds have been allocated to projects that address primarily clean air.

While projects are classified in a primary benefit category, multiple benefits are encouraged. The attribution to a specific primary environmental impact needs to be interpreted in conjunction with the following. Of the total portfolio of 133 funded projects:

- 89% of SDTC-funded projects have climate change benefits;
- 81% have clean air benefits;
- 38% have soil or water benefits; and,
- 87% of all SDTC projects have more than one environmental benefit.

SD Tech Fund™ Completed Projects

This section provides a summary of all projects completed to date. Seven were completed in 2005, three in 2006 and seven in 2007.

For each project completed an evaluation of the Project Impact has been included within this section. Post-project reporting continues past project completion so as to understand the evolution of the technologies and the Market Impact of each funded project. Such Market Impacts are reported 2 years after completion and are included in this report where applicable.

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 results in some successful projects requiring further development and/or demonstration before reaching commercialization. Understanding that the purpose of the fund is to assist with de-risking of technology, it is to be expected that a number of projects may not succeed either from a technological or economical perspective.

Overall, the results to date are encouraging. While project impacts vary depending on the nature and the stage of the projects, all 17 projects have achieved positive results that will enable them to move to the next stage in their progress to market and only 1 project was terminated early due to technology challenges.

Science Applications International Corp. Canada (SAIC Canada)

Round 6-2004B

Sector:

Energy Utilization

Project Delivery

Completion:

November 2007

Market Impact

Report Due:

November 2009

Total Project Value:

\$4,846,556

SDTC Funding:

\$1,009,589

Leveraged Funding:

\$3,836,967

Consortium Members:

Science Applications International Corp.

Town of Okotoks

ATCO Gas and Pipelines Ltd.

United Acquisition II Corp. (United Communities)

Sterling Homes Ltd.

Natural Resources Canada (CANMET Energy

Technology Centre – Ottawa)

Climate Change

Central/Energy Solutions

Alberta (Prov. Of Alberta)

Project Title:

Demonstration of Borehole Thermal Energy Storage System (BTES)

Project Description:

SAIC Canada is demonstrating an innovative Underground Thermal Energy Storage (UTES) system, and would be the first one of its kind in North America utilizing 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. This portion of the project involves using a Borehole Thermal Energy Storage (BTES) system for seasonal heating application at a demonstration site near Okotoks, Alberta. Another part of the project using an Aquifer Thermal Energy Storage (ATES) system (Round 6 – 2004B) will be demonstrated in a commercial condominium complex in Medicine Hat, Alberta.

Objectives:

To demonstrate the technical feasibility of seasonal storage of solar energy in Canada in order to deliver up to 90% of the space heating requirements for residential buildings in the winter months through thermal energy stored underground in boreholes during the summer months.

Results:

- The BTES was successfully installed, commissioned and put in operations at the Drake Landing Solar Community consisting of 52 single dwelling R-2000 homes in the town of Okotoks, Alberta. 798 solar thermal collectors were installed on the roof of garages to collect thermal energy during the summer months and used to charge the BTES system.
- Four months of performance data (1st heating season) was extensively collected (at 10-minute intervals) and used to calibrate a simulation model (TRNSYS)¹ to predict the full system energy flows and impact. This was necessary as the full charging of the BTES will take 5 years which will take the project duration to beyond the time limit of a SDTC funded project. The results from the model indicated that the BTES is on track to meeting its year 5 targets.

¹TRNSYS is developed by Thermal Energy System Specialists, a recognized leader in energy system simulations who have successfully applied the model to other similar applications

Project Impacts:

- 4.7 tonnes CO₂e/y per house (74% reduction) by year 5 based on model projections.

Path to Market:

- The SAIC thermal district heating system can be applied primarily to new residential communities, with market penetration dependent on energy costs as well as multiple stakeholder buy-in.

Sunarc of Canada Inc.**Round 6-2004B**

Sector:

Energy Utilization

Project Delivery

Completion:

August 2007

Market Impact

Report Due:

August 2009

Total Project Value:

\$1,844,387

SDTC Funding:

\$553,719

Leveraged Funding:

\$1,290,668**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

Project Title:*Removable Foam Installation System for Green Houses***Project Description:**

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 and recovers 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.

Objectives:

To demonstrate GHG reductions through lowering the winter heating demands of greenhouses equipped with the Sunarc technology and to increase the output of saleable products due to shading provided by the foam in the hot months.

Results:

- The Sunarc system was tested at 5 sites in Ontario and Quebec.
- Having five(5) demonstration sites allowed Sunarc to determine the applicability for various greenhouse designs and ultimately resulted in three (3) successful installations.
- Monitored data was obtained from the remaining 3 test sites under various conditions and heat sources (oil, natural gas and partial biomass heating).

Project Impacts:

- The aggregated GHG reductions at the three sites based on 95 total days of monitored data was 5.2kgCO₂e/m² greenhouse. This corresponds to an approximate GHG reduction of 36% over the baseline during winter night-time operation.
- Use of the Sunarc system for shading resulted in reduced incident of blossom end rot and increase in saleable yield of 5% to 63% (crop dependent) vs. control plots and higher grade produce resulting in a 7% improvement in profitability.

Path to Market:

- Sunarc is pursuing initial sale opportunities with the growers which participated in the Project.

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

Sector:

Transportation

Project Delivery

Completion:

December 2006

Market Impact

Report Due:

December 2008

Total Project Value:

\$332,604

SDTC Funding:

\$152,844

Leveraged Funding:

\$179,760**Consortium Members:**

M.A. Turbo/Engine Ltd.

Neptune Bulk Terminals
(Canada) Ltd.

Rival Technologies Inc.

Project Title:*Reduction of Diesel Engines Exhaust Gas Emissions by Water Injection***Project Description:**

M.A. Turbo/Engine Ltd. is demonstrating a water-injection system for diesel engines which is designed to achieve significant reductions of Nitrogen Oxides (NO_x) 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.

Objectives:

To demonstrate that the project's 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.

BIOX Canada Ltd.**Round 4-2003B**

Sector:

Energy Exploration and Production

Project Delivery

Completion:

December 2007

Market Impact

Report Due:

December 2009

Total Project Value:

\$34,504,071

SDTC Funding:

\$5,000,000

Leveraged Funding:

\$29,504,071**Consortium Members:**

BIOX Canada Ltd.

Dynex Capital Ltd. Partnership

Weatons Holdings Ltd.

CS Investment Capital Ltd.

Notae Investments Ltd.

Cotyledon Capital Inc.

Bi-Pro Marketing Ltd.

BIOX Corp.

FCC Ventures

Project Title:*New Atmospheric Technology for Biodiesel Production***Project Description:**

BIOX Canada Ltd. is demonstrating a technology to convert agricultural seed oil, cooking oils/grease, 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.

Objectives:

To design, construct, commission and operate a 67 million litres/y (nameplate capacity) biodiesel manufacturing facility near Hamilton, Ontario consisting of two parallel production trains and capable of using multiple low-cost feedstocks including animal fats or tallows and other recovered vegetable oils.

Results:

- Successfully completed construction and commissioning of demonstration facility in 2007 after initial delays to correct design deficiencies.
- Produced the first million litres of biodiesel meeting ASTM D6751-6b standards in 2007 with clarity acceptable for diesel engine applications.
- Plant gradually achieving stable operations – produced over 18 million litres of biodiesel by the end of February 2008.

Project Impacts:

- The BIOX process achieved an estimated GHG emission reduction intensity of 2.96 kg CO₂/litre of conventional diesel displaced.

Path to Market:

- BIOX has entered into off-take agreements with customers for a portion of the plant's output with the remaining portion available for the spot market to take advantage of higher price opportunities.
- With the experience gained from the Hamilton facility, BIOX expects to proceed with the construction of up to 4 more plants at strategic locations in North America.
- BIOX has established a U.S. subsidiary and established a blending facility in New Jersey to facilitate sale to the U.S. market.

Nanox inc.**Round 4-2003B**

Sector:

Transportation

Project Delivery

Completion:

August 2007

Market Impact

Report Due:

August 2009

Total Project Value:

\$4,463,248

SDTC Funding:

\$1,800,000

Leveraged Funding:

\$2,663,248**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 Quebec

(funding partner)

Project Title:*Nanox inc. Phase 1 : Diesel Oxydation Catalyst (DOC), Three-Way Catalyst (TWC) and Scale-Up***Project Description:**

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 diesel automobiles. 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.

Objectives:

To demonstrate the viability of replacing platinum with Nanox Perovskite in a catalytic converter by developing and selecting the optimum formulation for DOC and TWC products; designing and constructing a 18t/yr pilot manufacturing facility and to commercially qualify the catalysts through laboratory testing followed by acceptance testing by catalyst manufacturers.

Results:

- The Nanox Perovskite synthesis technology was successfully scaled up using high energy ball milling in two steps.
- Based on the optimized process parameters, a pilot plant with 18t/y capacity was designed, built and operated to produce sufficient catalyst material for testing purpose only in order to minimize cost and waste.
- Testing of the catalyst in various formulations was performed in a laboratory under static conditions.

Project Impacts:

- Up to 20% increased conversion rate of CO and up to 60% increased conversion rate of NOx compared to PGM catalysts was achieved based on limited testing and under cold-starting conditions in a laboratory setting.

Path to Market:

- The replacement of PGMs with Nanox perovskite in catalytic converters represents a potentially significant reduction in upstream GHG emissions (associated with the mining and processing of raw materials) of approximately 748tCO₂e/kg Pt replaced by Nanox perovskite.
- Nanox is in partnership discussions with several catalyst manufacturing companies to continue the product evaluation program and to develop TWC products for specific types of automobiles (diesel).

Plug Power Canada Inc (formerly Cellex Power Products Inc.)**Round 3-2003A**

Sector:

Transportation

Project Delivery

Completion:

April 2007

Market Impact

Report Due:

April 2009

Total Project Value:

\$9,026,000

SDTC Funding:

\$2,000,000

Leveraged Funding:

\$7,026,000**Consortium Members:**

Plug Power Canada Inc.

Fuel Cells Canada

Arpac Storage Systems Corp.

Project Title:*Fuel Cell Power Unit for Industrial Vehicles***Project Description:**

Plug Power Canada Inc. is developing and demonstrating hydrogen fuel cells to replace industrial lead acid batteries and Internal Combustion Engines (ICE) 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.

Objectives:

To assemble and test prototype (alpha) fuel cell systems for use in lift trucks and to demonstrate and validate performance in actual field trials.

Results:

- After an initial delay due to performance issues associated with the original fuel cell stack selected, Plug Power successfully designed, assembled and tested fuel cell systems for use in Class 3 fork-lift trucks.
- The fuel cell systems were incorporated into 6 lift trucks for in-house testing (2) and field trials (4).
- Field trials were undertaken at the distribution centres of London Drugs in Richmond, BC and of Wal-Mart in Harrisonville, MO. In both cases, performance exceeded expectations in terms of reliability (99% uptime), power availability during shift (no drop off vs. 8% to 10% drop off in lead-acid battery powered lift trucks), ease of use and safety (no incidents with operations or fueling).

Project Impacts:

- Compared to Class 3 lift trucks powered using ICE fueled by propane, the GHG emission reduction intensity is estimated to be 0.61kg of CO₂e/kWh and 0.024 kg of CAC/kWh using North American average emission factors for grid electricity generation. Based on the average power demand and annual operating hours of this class of lift trucks, the intensity factors translate into annual GHG reductions of 4.3t/truck and CAC reductions of 0.17t/truck.
- Compared to battery powered lift trucks, there is no net benefit or slight increase in GHG emission intensity depending on the source of the hydrogen supply, along with minor CAC reduction intensities.

Path to Market:

- The successful demonstration resulted in Wal-Mart placing an order for an undisclosed number of fuel cell powered lift trucks to be supplied by Plug Power Canada Inc.
- Plug Power is planning on the launch of its commercial fuel cells product (CX-P150) for Class 3 lift trucks in early 2008, followed by progressive development and launching of fuel cell systems for larger size lift trucks.
- The application of H₂ fuel cells to the fork-lift industry furthers the adoption of fuel cells by creating immediate volume and driving down manufacturing cost.

Hydrogenics Corp.

Round 3-2003A

Sector:

Transportation

Project Delivery Completion:

September 2005

Market Impact

Report Due:

September 2007

Total Project Value:
\$3,069,135

SDTC Funding:
\$1,350,419

Leveraged Funding:
\$1,718,716

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)

Project Title:

Integration and Demonstration of Fuel Cell Powered Material Handling Equipment

Project Description:

Hydrogenics Corp. 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.

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 fork-lift replacement): reduction of 9 tonnes CO₂e/year/vehicle; reduction of CO, NO_x, and VOCs by 1.5, 0.23, and 0.18 tonnes/y/vehicle, respectively.
- Emissions intensity (battery fork-lift replacement): increase of 5 tonnes CO₂e/year/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.

Market Impact:

- This initial project validated the concept and prototype fuel cell power packs. A follow-on project supported by SDTC funding (Round 8-2005B) takes it the next step to validate end-user acceptability through extensive field testing prior to market roll-out. As such, market impact results for both projects will be provided following the completion of the follow-on project.

Paradigm Environmental Technologies Inc.

Round 3-2003A

Sector:

Waste Management

Project Delivery

Completion:

October 2005

Market Impact

Report Due:

October 2007

Total Project Value:

\$1,208,804

SDTC Funding:

\$250,000

Leveraged Funding:

\$958,804

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

Project Title:

MicroSludge™ Prototype Development Project

Project Description:

Paradigm Environmental Technologies Inc. is demonstrating a novel technology for lowering the biosolids output from conventional wastewater treatment process 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.

Objectives:

To demonstrate the effectiveness of Paradigm's MicroSludge™ process for the reduction of volatile solids in municipal wastewater 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.

Market Impact:

- Paradigm has made a number of improvements to make the technology more robust, simpler and more compact. The resulting MicroSludge™ System 25 was demonstrated at the Joint Water Pollution Control Plant (JWPCP) in Los Angeles County for one year starting in October 2005. While there were a number of lessons learned as part of the demonstration, the JWPCP is not expected to adopt MicroSludge™ until the unit is proven with WAS only digestion at another facility.
- In 2007 Paradigm began operation of a third, full-scale trial at the Des Moines Metropolitan Wastewater Reclamation Facility which produces approximately 5,500 dry tons of WAS annually at about 7.1% total solids. The MicroSludge™ System 25 will process approximately half of the WAS generated at the plant.
- The customer base has long sales cycles and requires multiple reference installations before committing to adoption.

Enerkem Technologies Inc.

Round 2-2002B

Sector:

Waste Management

Project Delivery

Completion:

January 2005

Market Impact

Report Due:

January 2007

Total Project Value:

\$2,253,418

SDTC Funding:

\$720,573

Leveraged Funding:

\$1,532,845

Consortium Members:

Enerkem Technologies Inc.

SOQUIP Énergie Inc.

Government of Quebec

R&D Tax Credit

Enviro-Access Inc.

Université de Sherbrooke (Groupe de recherche sur les technologies et procédés de conversion)

Ville de Sherbrooke

Project Title:

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

Project Description:

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.

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 with 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.

Market Impact:

- A follow-on project has been initiated supported by funding from SDTC (Round 9 – 2006A) to continue the development of the Enerkem technology by reforming methanol in order to complete the synthesis step for ethanol production. As such, market impact results for both projects will be provided following the completion of the follow-on project.

Highmark Renewables Inc.

Round 2-2002B

Sector:

Agriculture

Project Delivery

Completion:

June 2005

Market Impact

Report Due:

June 2007

Total Project Value:

\$7,056,245

SDTC Funding:

\$1,000,000

Leveraged Funding:

\$6,056,245

Consortium Members:

Highmark Renewables Inc.
Natural Resources Canada
(TEAM)

Alberta Agriculture Food &
Rural Development

Alberta Research Council

Alberta Agricultural Research
Institute

Climate Change Central

Canadian Environmental
Technology Advancement
Centre (CETAC)-West

Federation of Canadian
Municipalities (Green Municipal
Investment Fund)

Greenhouse Gas Mitigation
Program for Canadian
Agriculture

University of Alberta

Project Title:

Integrated Manure Utilization System (IMUS)

Project Description:

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.

Objectives:

To utilize Alberta Research Council's 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 CO₂e 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 CO₂e.

Market Impact:

- Operation of the demonstration facility has increased the knowledge of the biology, mechanics and economics of the facility. The IMUS and the knowledge associated with it will be a critical component in future biorefineries.
- The facility is estimated to have reduced GHG by 6,000 tonnes CO₂e and avoided land application of 15,000 tonnes of manure for 2007.

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

Total Project Value:

\$3,483,350

SDTC Funding:

\$500,400

Leveraged Funding:

\$2,982,950

Consortium Members:

Mikro-Tek Inc.

North Sun Nurseries Inc.

Woodrising Consulting Inc.

IBK Capital

TransCanada Pipelines Ltd.

Noranda Inc. / Falconbridge Ltd.

Project Title:

Soil Carbon Sequestration using Mycorrhizal Management Technologies in Agricultural Crops Reclamation Grasses

Project Description:

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 has developed a method to inoculate seedlings and plant roots. The increased growth rates enables these plants to capture harmful climate change gases and assists gas pipeline and mining companies to cost-effectively reduce their environmental and social impact.

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.

Market Impact:

- Information was not available at the time of publishing.

West Lorne Bio-Oil Co-Generation Partnership (formerly Dynamotive)**Round 2-2002B**

Sector:

Power Generation

Project Delivery

Completion:

July 2005

Market Impact

Report Due:

July 2007Total Project Value:
\$12,215,947SDTC Funding:
\$5,000,000Leveraged Funding:
\$7,215,947**Consortium Members:**West Lorne Bio-Oil Co-
Generation Partnership

Ontario Power Generation Inc.

Orenda - Division of Magellan
Aerospace Corp.

UMA Engineering Ltd.

Erie Flooring and Wood
Products**Project Title:***Erie Flooring BioOil Cogeneration Plant***Project Description:**

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) in an integration 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.

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:

- West Lorne Bio-Oil Co-Generation Partnership'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 7kt CO₂e/y. A cumulative reduction of 140,000t CO₂e is expected over each plant's expected 20-year lifetime.

Market Impact:

- West Lorne Bio-Oil Co-Generation Partnership's demonstration plant continues to successfully prove out its technology and, after a shutdown for upgrading, is close to achieving its designed plant capacity of 130t/day of feedstock processing.
- Dynamotive, the parent company that runs the West Lorne project, has recently commissioned a much larger plant in Guelph which, when running at full capacity, will process biomass feedstock at the rate of 200t/day.
- Dynamotive's technology has also been successful in attracting attention internationally and it has entered into memoranda of understanding for feedstock supply and plant construction in Argentina, the U.S. and Taiwan.

ZENON Environmental Inc.

Round 2-2002B

Sector:

Energy Utilization

Project Delivery

Completion:

December 2007

Market Impact

Report Due:

December 2009

Total Project Value:

\$5,334,000

SDTC Funding:

\$1,760,000

Leveraged Funding:

\$3,574,000

Consortium Members:

Zenon Environmental Inc.

Ryerson University,
Department of Applied
Chemical and Biological
Sciences

McMaster University

Environmental Technology
Advancement Directorate
(ETAD)

Project Title:

ZeeLung™ Process for Industrial Wastewater Treatment

Project Description:

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.

Objectives:

To undertake pilot scale testing followed by the construction a ZeeLung™ MSBR demonstration facility and to validate commercial scale performance in terms of high oxygen transfer efficiency, low net sludge yield and high volumetric loading rate in different types of wastewater.

Results:

- Successfully completed pilot scale testing on 1.5m long ZeeLung™ MSBR units and discharge met or was below all Municipal sewer use by-law limits for contaminants.
- Built demonstration plant for testing 8m long commercial scale units.
- Completed testing of the commercial scale 8m long ZeeLung™ units but were not able to achieve the necessary performance due to difficulties in producing 8m long fibers of consistent quality and related manufacturing difficulties.
- ZENON achieved the design of a successful 2m long ZeeLung™ unit and will retain the capability to produce these units.

Project Impacts:

- The Pilot scale 1.5m units achieved energy uses as low as 10 kWh/m³ compared to conventional MBR operating at 19 kWh/m³, achieving the target of oxygen transfer > 60% and reducing sludge production to 50% of the MBR plant.

Path to Market:

- ZENON has concluded that due to manufacturing issues with the larger 8m units, it will focus on developing markets for the smaller 2m units where its technology can provide significant economic and environmental benefits to smaller sized waste water treatment plants.
- ZENON, with its parent company GE, is seeking partnerships with other industrial leading edge companies to support market introduction.

Bio-Terre Systems Inc.**Round 1-2002A**

Sector:

Agriculture

Project Delivery

Completion:

September 2007

Market Impact

Report Due:

September 2009

Total Project Value:

\$2,305,000

SDTC Funding:

\$864,375

Leveraged Funding:

\$1,440,625**Consortium Members:**

Bio-Terre Systems Inc.

Ferme Famille St-Hilaire

Enviro-Access Inc.

Ferme Peloquin

Hydro Québec

Université de Sherbrooke,
Groupe de Recherche sur les
Technologies et Procédés de
ConversionAgriculture and Agri-Food
Canada**Project Title:***Low Temperature Anaerobic Digestion and Co-Generation System for Hog Manure Management***Project Description:**

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.

Objectives:

To demonstrate that the low-temperature anaerobic digestion system for porcine manure results in reductions of GHG emissions during manure storage and spreading (through the reduction of up to 80% of baseline synthetic fertilizer use) and replacement of the heating fuel and/or grid electricity use through on-site generation of heat and/or electricity.

Results:

- Complete process integration and operations were successfully implemented and demonstrated at a hog farm in Quebec. Reductions in GHG emissions from avoided manure storage and fertilizer manufacture as well as from manure spreading were achieved.
- Synthetic fertilizer use was reduced by between 75-90% depending on the crop grown (corn or hay).
- The cogeneration unit successfully produced electricity from treated biogas. The actual electricity displaced was limited due to delay in securing suitable equipment and the need for extensive gas treatment (to remove hydrogen sulphide). Analysis undertaken by Bio-Terre suggests that better incentives for renewable energy are required to make cogeneration economical.

Project Impacts:

- The range of GHG emission reductions was between 0.12 and 0.127t CO₂e/m³ of manure, or 956t CO₂e/y per 10,000 head hog farm.
- 12,000 kWh of electricity was produced by the cogeneration unit during a trial period of 450 hours.

Path to Market:

- The target market is intensive porcine farming operations.
- Early demonstration efforts have focused on emission reductions from avoided manure storage and fertilizer manufacture as well as from manure spreading. Future potential for this technology includes heat generation, cogeneration or electricity generation given appropriate economic incentives for “green energy”.

Carmanah Technology Inc.**Round 1-2002A**

Sector:

Energy Utilization

Project Delivery

Completion:

January 2005

Market Impact

Report Due:

January 2007Total Project Value:
\$2,035,062SDTC Funding:
\$466,167Leveraged Funding:
\$1,568,895**Consortium Members:**Carmanah Technologies Inc.
BC Hydro
British Columbia Institute of
Technology**Project Title:***Edge-lit LED Lighting Project***Project Description:**

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.

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/y
- Emissions intensity (traffic signs): reduction of 0.0967kg CO₂e/unit/y
- Emissions intensity (bus shelter signs): reduction of 0.129t CO₂e/unit/y
- 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.

Market Impact:

- Two product lines using the SDTC supported technology have entered the market
- Total sales of over 8000 units valued at \$12M have been achieved
- Annual GHG reductions of approximately 727t CO₂e/y have been achieved globally and by 2010 annual reductions are forecasted with a potential to reach 2,600t CO₂e/y

CO₂ Solution Inc.**Round 1-2002A**

Sector:

Energy Exploration and Production

Project Delivery

Completion:

June 2006

Market Impact

Report Due:

June 2008Total Project Value:
\$5,881,558SDTC Funding:
\$1,000,000Leveraged Funding:
\$4,881,558**Consortium Members:**CO₂ Solution Inc.Aluminum Association of
CanadaCIFM (Centre intégré de
fonderie et de métallurgie)

Elkem Metal Canada

Fonderie industrielle Laforo inc.

Ville de Québec

Place Bonaventure

Federation of Canadian
Municipalities (Green Municipal
Investment Fund)**Project Title:***CO₂ Capture, Sequestration & Recycle***Project Description:**

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.

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.

Westport Research Inc.

Round 1-2002A

Sector:

Transportation

Project Delivery

Completion:

August 2006

Market Impact Report Due:

August 2008

Total Project Value:

\$3,115,376

SDTC Funding:

\$1,000,000

Leveraged Funding:

\$2,115,376

Consortium Members:

Westport Research Inc.

Enbridge Gas Distribution Inc.

Challenger Motor Freight Inc.

Project Title:

Demonstration of Use of Liquefied Natural Gas (LNG) and Westport Fuel Injector Technology in Heavy Duty Trucks

Project Description:

Westport Research Inc. is demonstrating a novel fuel injector technology which 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.

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; and
- 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 130kt CO₂e/y by 2015, with total cumulative reductions of 250kt CO₂e over that period.

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



NextGen Biofuels Fund™ Introduction

Purpose

The purpose of the NextGen Biofuels Fund™ is to:

- facilitate the establishment of First-of-Kind Large Demonstration-scale facilities for the production of next-generation renewable fuels and co-products;
- improve the sustainable development Impacts arising from the production and use of renewable fuels in Canada; and,
- encourage retention and growth of technology expertise and innovation capacity for the production of next-generation renewable fuels in Canada.

The NextGen Biofuels Fund™ incorporates a requirement that all contractual agreements between SDTC and Eligible Recipients include repayment terms based on free cash flow over a period of 10 years after project completion.

Eligible Projects

A project, to be an Eligible Project, must:

- be a first-of-kind facility that primarily produces a next-generation renewable fuel at large demonstration-scale;
- be located in Canada; and
- use feedstocks that are or could be representative of Canadian biomass.

Funding Criteria

The Foundation will exercise its discretion in the allocation of funding to Eligible Recipients, in accordance with the following criteria:

- the Eligible Recipient's access to the necessary technical, financial and management capacity to successfully undertake the Eligible Project;
- the level of necessary funding required from the Foundation to ensure that the Eligible Project proceeds;
- the potential of the production pathway to deliver sustainable development benefits (social, economic and environmental) by:
 - sustainably expanding renewable fuel production in Canada;
 - improving the environmental benefits arising from the production and use of renewable fuels including the life-cycle fossil energy balance and life-cycle emissions of greenhouse gases;
 - reducing the overall financial costs of Renewable Fuels; and,
 - generating economic benefits for a wide range of communities.

More detail on the funding process can be found in the Funding section of the SDTC website at: www.sdtc.ca

NextGen Biofuels Fund™ Portfolio Project Descriptions

The NextGen Biofuels Fund™ Funding Agreement was signed on September 4th, 2007 with a call for applications being launched immediately after that. As such, as of December 31, 2007, no projects have been approved for funding under this Fund.

Index of SDTC Funded Project Descriptions

3G Energy Corp.	11	Envirogain Inc.	31
6N Silicon Inc.	11	EnviroTower Inc.	7
Advanced Bio-Refinery Inc.	22	Ferrinov Inc.	7
Advanced Lithium Power Inc.	12	Fifth Light Technology Ltd.	14, 41
AgroTerra Biotech Inc.	12	General Electric Canada	8, 19
AirScience Technologies Inc.	29	Gradek Energy Inc.	41
Altek Power Corp.	12	Great Northern Power Corp.	39
Alternative Green Energy Systems Inc.	38	Green Canal Holdings Inc.	24
Angstrom Power Inc.	35	Group IV Semiconductor Inc.	36
ARISE Technologies Corp.	22	Highmark Renewables Inc.	67
Atlantic Hydrogen Inc.	38	Hillsborough Resources Ltd.	19
Atlantic Packaging Products Ltd.	39	HSM Systems Inc.	8
Bio Vision Technology Inc.	22	HTC Hydrogen Technologies Corp.	14
Biogénie S.R.D.C. inc.	13	Hydrogenics Corp.	24, 64
Bio-Terre Systems Inc.	71	IBC Technologies Inc.	45
Biothermica Technologies Inc.	5, 17	Industrial Catalytic Technologies Inc.	20
BIOX Canada Ltd.	61	Lignol Innovations Corp.	41
Blue-Zone Technologies Ltd.	43	M.A. Turbo/Engine Ltd.	60
Bystronic Solution Centre Inc.	23	Mabarex Inc.	46
Carmanah Technology Inc.	72	Magenn Power Inc.	20
CCR Technologies Ltd.	18	Maratek Environmental Inc.	32
Cerestech Inc.	23	Maritime Innovation	25
Chinook Mobile Heating & Deicing Corp.	23	MCW Consultants Ltd.	25
Clean Current Power Systems Inc.	35	Mechtronix Systems Inc.	25
Clear-Green Environmental Inc.	30	Menova Energy Inc.	9
CO ₂ Solution Inc.	73	Middle Bay Sustainable Aquaculture Institute.	14
Corporation HET	5	Mikro-Tek Inc.	68
CVT Corp.	13	Milligan Bio-Tech Inc.	20
DeCloet Greenhouse Mfg. Ltd.	40	MinMiner Technologies Ltd.	21
Dépôt Rive-Nord inc.	30	MSR Innovations Inc.	9
Développement Effenco inc.	6	Nanox inc.	62
Dynamic Systems Inc.	18	Netistix Technologies Corp.	32
E.I. du Pont Canada Company	18	New Energy Corp. Inc.	26
Early Warning Inc.	13	Nexterra Energy Corp.	33
EcoSmart Foundation Inc.	31	Nova Chemicals Corp.	46
EcoVu Analytics	24	Nova Scotia Power Inc.	15
Electrovaya Corp.	36	N-Solv Corp.	32
Enerkem Technologies Inc.	19, 66	Nutriloc Ingredients Corp.	26
EnQuest Power Corp.	6	NxtGen Emission Controls Inc.	15
Ensyn Technologies Inc.	45	NxtPhase T&D Corp.	42

Section 8 - Index

Ostara Nutrient Recovery Technologies Inc.....	26	Suncor Energy Inc.	47
Outland Technologies Inc.....	33	Synodon Inc.	43
Paradigm Environmental Technologies Inc.	65	Tantalus Systems Corp.	28
Parkland BioFibre Ltd.....	36	Tenova Goodfellow Inc.	39
Peacock Industries.....	27	Terragon Environmental Technologies Inc.	16
Petroleum Technology Research Centre Inc.....	33	The Pressure Pipe Inspection Company Ltd.	28
Plasco Trail Road Inc.	34	TM4 Inc.....	10, 16
Plug Power Canada Inc.....	63	Trilogics Technologies Inc.	10
Power Diagnostic Technologies Ltd.	34	TSC Company Ltd.	28
Power Measurement Ltd.	27	Turbo Trac Systems ULC.....	17
Prairie Pulp and Paper Inc.	37	Unicell Ltd.....	29
Pratt & Whitney Canada Corp.....	37	University of British Columbia.....	38
Quantiam Technologies Inc.....	44	University of New Brunswick.....	46
Radiant Technologies Inc.....	45	Vaperma Inc.	35
RailPower Technologies Corp.....	44	Vidir Biomass Inc.	11
RenewABILITY Energy Inc.....	21	West Lorne Bio-Oil Co-Generation Partnership.....	69
Sacré-Davey Innovations Inc.	42	Westport Research Inc.	74
SAIC Canada.....	37, 58	Whitefox Technologies Canada Ltd.....	43
Saskatchewan Power Corp.	44	Wind Smart Inc.	29
SHEC Labs.....	34	Woodland Biofuels Inc.	17
SiREM Canada.....	15	Xantrex Technology Inc.	40
Sonic Environmental Solutions Inc.....	16	ZENON Environmental Inc.	70
St-Jean Photochimie.....	9	Zenon Membrane Solutions.....	21
Sunarc of Canada Inc.....	59		