# SDTC 2013 Corporate Plan

SUSTAINABLE DEVELOPMENT TECHNOLOGY CANADA<sup>™</sup>

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The SDTC Corporate Plan has been created by the Government of Canada and was published in October 2012. Figures in this document are current as of June 30, 2012, unless otherwise stated.

FSC LOGO

SD Tech Fund  $^{\rm TM}$  , NextGen Biofuels Fund  $^{\rm TM}$  and SD Business Case  $^{\rm TM}$  are trademarks of SDTC.

The SDTC Corporate Plan—Executive Summary is available online at **www.sdtc.ca** Hard copies of the SDTC Corporate Plan may be obtained on request. Sustainable Development Technology Canada (SDTC) was established by the Government of Canada to serve as the primary catalyst building a sustainable development technology infrastructure in Canada. From an initial investment of just under \$5 million in 2002, SDTC's portfolio has grown to 238 projects across Canada with a total leveraged project value of \$2 billion, 82% of which comes from the private sector.







## Preface

SDTC projects provide technology solutions for major economic sectors in Canada by helping commercialize technology solutions thereby deliver economic, environmental and health benefits to Canadians in every province of the country. The following sections will discuss the variety of ways in which SDTC provides value to Canada.

### Figure 1 - SDTC Commercializes Technologies Percent of GDP\* Across Canada's Major Economic Sectors SDTC's **Goods-Producing Portfolio Value Industries Subset Agriculture & Forestry** \$245,621,459 8% SDTC Snapshot: Agrisoma has produced a biojet fuel in partnership with Honeywell from a non-food, industrial oilseed grown in Saskatchewan. \$362,190,783 16% Mining & Oil and Gas SDTC Snapshot: Titanium's oil sands technology reduces water use by approximately 25% and recovers heavy minerals, valued at over \$400 million per year. Manufacturing 45% \$451,327,454 SDTC Snapshot: Tenova Goodfellow's monitoring systems are in use in steel mills in Canada, the US and Italy, reducing production times and total energy use. **Utilities** SDTC Snapshot: Tantalus Systems Corp.'s smart grid technologies are giving consumers a real-time measure of their power consumption and \$374,925,576 allowing utilities to manage operations more efficiently, leading to power **9**% reductions of up to 20%. **Construction Industries** \$12,145,654 21% SDTC Snapshot: New Condo towers in the Toronto area are being built with dPoint's technology, bringing a 65% increase in heating

SDTC-supported technologies also contribute to the competitiveness of services-producing industries – the other major subset of Canada's GDP. SDTC's portfolio value in these industries is \$502 M, primarily in transportation and waste management.

\* Goods-producing industries subset of GDP. Source: CANSIM table 379-0027

Figures as of Dec 31, 2011

and cooling efficiency.

## 1. SDTC Strengthens and Diversifies Canada's Economy

Through SDTC's investment in emerging technologies, the Government of Canada is building a stronger, more competitive and diverse economy. SDTC's portfolio of 238 projects includes 106 technology types, providing improved performance and productivity for Canadian industry. SDTC supports regional economies, strengthening companies across the entire country. This builds on provincial strengths and creates opportunity and investment.

SDTC is strengthening the economy by supporting technologies that will create new employment in emerging businesses and upgrade competitiveness of traditional industries. Investment in these technologies has the potential to create more and higher paying jobs than other policy options—up to four times as many jobs per dollar than tax cuts, according to the United Nations Environment Programme (UNEP) Sustainable Energy Finance (SEF) initiative.<sup>1</sup>

Recognizing this, in June 2011, the Government of Canada announced a new allocation of \$40 million to enable SDTC to continue its work that "supports the creation of high-value jobs."<sup>2</sup>

In 2011, the number of cleantech<sup>3</sup> jobs in Canada topped 44,000. These are highly skilled, high quality jobs that offer median wages 13% higher than the average.<sup>4</sup> Further, job multipliers for the clean technology industry exceed 8.7 direct and indirect jobs per initial \$1M demand. This is higher than the traditional and well-established industries in Canada, as can be seen in the following figure.



#### Figure 2 - Direct and Indirect Job Multipliers for Established Industries and Clean Technology

While the Canadian job creation potential from cleantech as an industry is impressive, SDTC-supported cleantech firms do even better. From 2008 to 2010, SDTC-funded companies enjoyed employment growth of 10 percent compared to 7 percent of non-SDTC cleantech companies.<sup>5</sup> Global economic uncertainty remains and as an export dependent country, Canada is adversely affected. Diligence in pursuit of growth areas is critical. An important contributor is the cleantech/clean energy sector which saw a year-over-year growth in revenue of 18% in 2012.

SEF Alliance (2009) "Why Clean Energy Public Investment Makes Economic Sense: the Evidence Base" http://www.sdtc.ca/uploads/documents/en/UNEP%20SEF%20Alliance%20Report.pdf, p 12.

<sup>2.</sup> Government of Canada (2011) The Next Phase of Canada's Economic Action Plan for Jobs and Growth, http://www.budget.gc.ca/2011/plan/Budget2011-eng.pdf (accessed September 2011) p. 146

<sup>3.</sup> Cleantech is a very broad, heterogeneous grouping of technologies that includes energy and water technologies which increase efficiency and performance in important markets—such as oil and gas, mining, forestry, agriculture, power generation, waste management and for industrial/commercial/domestic end uses. Further, as these technologies deliver environmental as well as economic benefits, they plan an important role in the health of all Canadians.

Brookings Institute (2011) Sizing the Clean Economy: a national and regional green jobs assessment http://www.brookings.edu/~/media/research/files/reports/2011/7/13%20clean%20economy/0713\_clean\_economy.pdf

<sup>5.</sup> Analytica Advisors

## 2. SDTC Adds Value to Canada's Natural Resources

In 2010 alone, Canada's natural resource sectors—including forestry, mining, and oil and gas—generated 11.5 percent, or \$143 billion, of Canada's gross domestic product (GDP) and directly employed close to 763,000 people<sup>6</sup>. Investment in a sustainable development technology infrastructure will ensure that Canada's natural resource sectors will remain vibrant, innovative, environmentally sensitive, and competitive. To support that objective, SDTC's natural resources portfolio includes includes 191 projects worth \$501 million of project investments for a total project value of \$1.9 billion.

### Figure 3 - Total SDTC and Leveraged funding by Province



<sup>6.</sup> Natural Resources Canada (2011) "Important Facts on Canada's Resources" http://www.nrcan.gc.ca/stat/index-eng.php (accessed September 2011)

**Clean Energy** - SDTC technologies are helping to address key environmental issues associated with fossil fuel extraction, production and distribution. Approximately 80 percent of SDTC's portfolio touches on clean energy production, power generation, transportation and/or energy utilization/ efficiency. Twenty-two percent of SDTC funds are allocated to technologies that support the extraction and production of cleaner fossil fuels. This includes processes that use solvents instead of steam to draw heavy oil from reserves are significantly reducing water and energy consumption.

The remaining 20 percent of SDTC's portfolio are related to sustainable use of water and land, which are essential to socially acceptable production and use of energy.

SDTC-funded companies work with Go-to-Market consortia that include technology end-users. As such, SDTC has projects with many of the major players in the oil and gas industry. Innovative SDTC-supported technologies are enabling companies to reduce greenhouse gas and particulate emissions, clean up tailing ponds, and reduce water usage. SDTC has partnered with key organizations including CAPP, OSLI, CCEMC, COSIA, PTRC, PTAC, and Alberta Innovates to further the diffusion of these important technologies. This will support access to key markets for SDTC-supported companies, maintaining and creating employment in this vital industry.

**Forestry** -The Government, through SDTC, has invested \$34 million into 12 projects related to forestry practices, with a total leveraged value under management of \$115 million. With SDTC's help, Canadian companies are developing technologies to seize upon the waste-to-energy and waste-to-value opportunities in the forestry sector. These innovations allow forestry operations to generate their own clean heat and power from the waste they produce and enable new revenue streams by converting waste into in-demand products such as chemicals, solvents and consumer goods such as next-generation biofuels.

SDTC was an early contributor to the BioPathways study developed with the Forest Products Association of Canada and has championed biorefineries since first identified in the 2004. SDTC has partnered with leading organizations, such as Canadian Renewable Fuels Association, BioteCanada, Canada Wood Council, and Forest Products Association of Canada to further the commercial uptake of SDTC-supported technologies by key market adopters.

**Mining** – The mining sector contributed \$36 billion and 308,000 jobs to the Canadian economy in 2010.7 Canada's mining industry plans to invest a further \$139 billion in new projects nationwide over the next decade, making it one of the key engines of growth.<sup>8</sup> SDTC has invested demonstration projects for technologies that will improve the efficiency of extraction while protecting workers' lives and concomitantly reducing environmental impacts, and is now seeing a significant increase in Green Mining applications.

<sup>7.</sup> http://www.mining.com/2012/02/03/mining-in-canada-contributed-36-billion-to-gdp-300000-jobs-new-report-finds/

<sup>8.</sup> http://www.mining.com/2012/02/03/mining-in-canada-contributed-36-billion-to-gdp-300000-jobs-new-report-finds/

## 3) SDTC Mobilizes Private Capital and Leverages Public Monies Extensively

To make the most out of its public funding, SDTC engages the private sector to form Go-to-Market consortia. This consortium approach has two strategic advantages. First, it reduces the risk to public money by ensuring relevance to customers and the marketplace. Second, it increases the probability of commercialization of the technology by bringing private sector investors into the equation at a very early stage and engaging the necessary end users and customers to participate in real world applications that meet customer demand.

SDTC optimizes the value of its funding by leveraging private sector investment in two critical ways. Initially, SDTC does so through obtaining non-Federal Government money into the project consortium at a level of about one Federal dollar to 3 non-Federal dollars. Of the \$2.1 billion in total eligible project value (as of June 30, 2012), \$581 million, or 27 percent, was contributed by the Government through SDTC and \$1.6 billion was leveraged from project consortia members (81 percent of which comes from the private sector).

The second and more significant leverage comes from SDTC's unique relationships with the private sector investment industry in Canada and internationally. Through SDTC's introductions to downstream investors of all classes, 52 of the more mature SDTC projects (ones that are not completed yet are readying for market) have attracted \$2.3 B in Follow-on Financing. Therefore, Government funds of \$158 million (representing SDTC's project contribution) have been leveraged 14 times, which is an unprecedented level across the Federal Government. As the portfolio matures and more projects achieve completion, this leveraged amount will increase significantly.

### Figure 4 - SDTC Portfolio Funding Breakdown



As a result of SDTC's private sector savvy and connectivity, the SDTC portfolio of projects represents the largest cleantech portfolio of its kind in the world. SDTC and its partners invest 1.5 times all other cleantech venture capital investment in Canada. In short, SDTC is the "Market Maker" for Canadian cleantech.

Once in the market, SDTC companies take several paths to later stage funding to support the commercialization of their technologies. Just under twenty percent of the Canadian cleantech companies listed on the TSX have received funding from SDTC. Further, 46 companies, into which SDTC invested \$100 million, have already accumulated revenues exceeding \$212 million prior to 2011, with an additional estimated \$190 million in 2011 alone. Also in 2011, EcoSythetix, an SDTC-supported company, posted the single largest cleantech IPO in Canada last year at \$100 million and was in the top 5 largest IPO's in all market categories.

## 4. SDTC Builds Economically Sustainable Businesses

Small and medium-sized enterprises (SMEs) — businesses with fewer than 500 employees – drive job creation in Canada. They employ 60 percent of the country's workforce, account for 45 percent of Canada's GDP and are responsible for 75 percent of net job growth.<sup>9</sup>

Because they are relatively small and mobile and operate in highly competitive markets, SMEs are a strong source of innovation in Canada. However, SMEs lack the resources, experience and expertise to bring their innovation to market. SDTC works closely with SMEs, helping them to successfully bridge the commercialization gap.

SDTC's primary function is to provide funding for development and demonstration projects where private sector investors are not willing to do so due to the level of risk. SDTC takes on and manages these technology and company development risks. To date, SDTC has processed funding requests in excess of \$5.5 billion from over 2,200 applications, incorporating over 7,000 entities. From these applications, SDTC has committed funding to 238 projects. SDTC is the "Funder of First Resort" helping applicants to be better able to obtain financing from other sources, creating a positive catalyzing effect.

SDTC's support for small and medium-sized businesses goes beyond funding. Through its due diligence and business development support, SDTC strengthens the SME's management capacity and value proposition. In later stages of the project, SDTC with its extensive industry and finance network, links SMEs with Canadian and international follow-on investors, and provides introductions to customers and channels partners.

Proof that SDTC's role produces superior performance is that compound annual growth in revenues for SDTC companies is almost twice that of non-SDTC cleantech companies. In short, SDTC companies outperform the market.

## 5. SDTC Enables Canada to Seize its Share of the \$4 Trillion Global Cleantech Market Opportunity

The global cleantech/clean energy market is estimated to be worth \$4 trillion.<sup>10</sup> To ensure that Canadian innovators are tapped into this large and growing market, SDTC contributes to the Department of Foreign Affairs and International Trade's (DFAIT) Cleantech Strategy, works with organizations such as the Export Development Corporation (EDC), and creates opportunities for SDTC companies to attract investment from international sources through its TSX-SDTC Investor Days and the SDTC Venture Summit.

With SDTC portfolio companies maturing, they are better able to tackle export markets. Consequently, SDTC and EDC have a strategic relationship that sees the partnership assess risk and then support portfolio companies with a menu of risk mitigation instruments to improve access to markets and sales.

Public Works and Government Services Canada (2010) "The Importance of SMEs" http://www.tpsgc-pwgsc.gc.ca/app-acq/pme-sme/importance-eng.html (accessed September 2011)

<sup>10.</sup> UK Department for Business & Regulatory Reform (BERR) (2009) Lower Carbon and Environmental Goods and Services: an industry analysis, http://www.bis.gov.uk/files/file50253.pdf (accessed September 2011) p. 5. The report found that found that the "global market value of the LCEGS sector was £3,046 billion in 2007/8."

An analysis of SDTC-supported technologies, based on the foundational work on global cost curves by SDTC and McKinsey and Company conducted in 2010, demonstrated that Canada has a significant international market advantage. SDTC's unique and proprietary database of technology benefits, market uptake statistics, and competitive analysis combined with McKinsey and Company's data, is the platform upon which these analyses are based. In fact, SDTC's portfolio has solutions to address 72% of the global market space for sustainable technologies at costs that are expected to meet, or be significantly lower than, those of competing alternatives. Therefore, SDTC's portfolio companies have the potential to make a significant contribution to Canada's export revenues. Further, the use of the SDTC platform is a key tool designed to help Canada determine where it should focus efforts. SDTC continues to work in collaboration with its colleagues in Government to leverage this resource.SDTC's support of its portfolio companies' go to market activities is focused on leveraging relationships within deep and relevant markets to help accelerate the companies' market entry and growth. For example, from a follow-on financing perspective, SDTC portfolio companies have excelled at attracting investment from large pools of capital in international markets and from corporate investors for whom SDTC's funded technologies are of particular strategic importance. As of Q2 2012, 57% of all follow-on financing raised by SDTC companies came from investors outside Canada, while these investors' share has almost doubled over the last three years. SDTC has seen the amount of financing raised from corporate / strategic investors also rise, accounting for just under 50% of all follow-on financing in 2011. There are further encouraging signs of new capital formation to take advantage of these trends. SAIL Capital out of California and T-Stone from South Korea via RCI Capital have announced new venture capital funds totalling over \$400 million targeted at Canadian cleantech investments, in particular those supported by SDTC.

In addition, SDTC is often requested to attest to the Canadian cleantech capacity at key conferences that attract an international audience. SDTC plays a key role in the Government of Canada's international activities, such as leading the clean water initiative in the Canada-Israel Science partnership, strengthening Canada-UAE relations through collaboration on a joint business council, and supporting Canada's sustainability position at Rio+20.

"Countries like "Hav China are making major investments in clean technology and we have to keep pace. Developing new technology is a high risk game and that can make investors nervous. SDTC helps offset much of the risk, which in turn encourages investment."

**Jayson Myers**, President & CEO, Canadian Manufacturers & Exporters  "Having an organization like SDTC focus on helping commercialize Canadian clean technology solutions is critical to Canada's global competiveness and leadership in clean technology."

> John Saabas, President, Pratt and Whitney Canada

## 6. SDTC Commercializes Innovation

It is not until the innovative clean technologies are deployed in the market that the majority of their economic and environmental benefits can be realized. SDTC provides crucial support to portfolio companies to help them commercialize their innovative technologies, including pre-project guidance and feedback for all applicants. SDTC works with technology developers to build their value proposition and develop solid business plans.

In the project delivery phase, the Foundation links project companies with consortia partners who provide project funding. As the projects progress, SDTC helps link technologies to financing and customers through programs such as the Follow-on Financing and the Technology Adoption Partnership initiatives via SDTC's unique network of business relationships.

SDTC's understanding of how innovation is adopted by the market enables its portfolio companies to outperform the market. Of the 63 completed projects (as of June 30, 2012), 56% percent have been adopted into the market, and 21 others, or 33 percent, are in advanced stages of commercialization. To date, SDTC has shepherded 35 technologies to market—either to the point of commercialization or fully into the market. This is well above the venture capital standard of 20 percent, even though SDTC operates at an earlier stage in the innovation process, taking on higher levels of risk than the majority of the venture industry.

## 7. SDTC is a Key Player in Establishing Canada as a Significant Force in NextGen Biofuels

The NextGen Biofuels Fund<sup>™</sup> (NGBF), created in September 2007, is aimed at supporting the establishment of first-of-kind large demonstration-scale facilities for the production of next-generation renewable fuels and co-products in Canada. The NGBF is intended to encourage the development of technology expertise and innovation capacity for production of renewable fuels from non-food biomass sources in Canada. In doing so, SDTC will provide advanced, value-added technologies that represent the future for the forestry, wood, and wood products industries, while in the agricultural sector these products and processes will both diversify agricultural revenues, reducing income volatility from commodity prices, and increase profits by turning agricultural waste into new revenue streams.

The NGBF leverages Canada's vast forestry and agricultural waste stocks, established supply chains, and leading edge technologies, positioning Canada to be a leading producer of next-gen biofuels and related technologies. This unique funding instrument has attracted interest from around the world. Over the past year, the NGBF has engaged over 200 companies, encouraged the best, and now has approved three Applications for Funding (AFF), with two additional AFFs in the approval process. NGBF is also reviewing 3 Indications of Interest (IoI) with several high potential projects in the pipeline for first-of-kind next-generation biofuels plants in Canada. SDTC's Board decisions have led to a possible commitment for 60% of the fund.

SDTC has strengthened Canadian capacity for NGBF through its work in the SD Tech Fund by supporting pre-commercial demonstrations of next-generation biofuels technologies. These are potential candidates for NGBF funding when they complete their projects and are ready to be scaled up for commercial production. Since traditional financing sources typically avoid first-of-kind demonstrations at any scale, SDTC bridges the financial and market gaps providing a complete array of demonstration funding in the next-generation biofuels market space, from pilot to commercial.

## 8. SDTC is Cost Effective and Vigorously Protects Canada's Investment

Through its excellence in governance, strong leadership and good management, SDTC has demonstrated that it is a trustworthy and responsible guardian and steward of public funds. SDTC has undergone extensive audits and evaluations that consistently affirm and reaffirm that Canada is getting optimal value for its investment in SDTC.

A value-for-money audit conducted by Natural Resources Canada and completed in 2011 concluded that "SDTC has implemented and follows practices and processes to achieve each of the audit objectives." The audit examined Strategic Decisions, Approval and Monitoring of Projects, Performance Measurement and Reporting, and Human Resources Management Practices. It acknowledged SDTC's proactive approach to identifying potential and emerging issues and dealing with them effectively, including seeking assistance from the federal government where appropriate. The audit attested to SDTC's efficiency and effectiveness and found that SDTC's operating expenses were reasonable and consistent with the objectives of the fund.

Since the audit, SDTC's Board responded to the Government's Deficit Reduction Action Plan by reducing the future lifecycle budget by 13%.

An independent evaluation of SDTC's cost-benefit analysis was undertaken as part of the second interim evaluation in 2009 and was updated in 2011. The 2009 evaluation found that SDTC delivered an unprecedented nine times return on investment through economic and social benefits.<sup>11</sup> The most recent analysis examined 78 SDTC-supported companies, into which SDTC invested \$124 million, and determined the net present value of total benefits assessed to be over \$3.2 billion. This represents a 26 times net present value over the original investment of public funds by SDTC.

The October 2011 report *Innovation Canada: a Call to Action* by the Review of Federal Support to Research and Development – Expert Panel Report supported SDTC's model and recommended it be applied even more broadly within Government.<sup>12</sup>

## 9. SDTC Strengthens Canada's Reputation Abroad

The Government of Canada's investment in SDTC demonstrates its commitment to innovation, efficiency and the environment for stakeholders around the world. This was highlighted by the inclusion of SDTC as a case study in a 2011 OECD report, *Studies on Environmental Innovation: Better Policies to Support Eco-Innovation.* The report held SDTC up as a role model for enabling public-private partnerships (PPPs) to promote eco-innovation—lending further international recognition of Canada's leadership in developing and sustaining the Foundation.<sup>13</sup>

SDTC's investment in technologies that lead to cleaner extraction, processing and utilization of fossil fuels address issues that create reputational risk in key export markets. This will support access to key markets, maintaining and creating employment in this vital industry.

International investors have given their stamp of approval to SDTC's processes. Of \$2.3 billion of follow-on financing raised to date, 57 percent has come from sources outside Canada. SDTC continues to be engaged by the international community on the strength of its portfolio. For example, SDTC recently formalized an arrangement with Veolia Environnement of France to accelerate the commercialization and market uptake of innovative Canadian clean technologies.

## 10. SDTC Informs and Enables Regulation

SDTC has supported technologies that enable regulated entities to meet their compliance obligations. This includes the reduction of greenhouse gas and particulate emissions, the remediation of oil and gas sites, meeting clean water standards, and addressing waste management requirements. Two-thirds of the projects funded by SDTC help companies meet regulatory compliance obligations.

The environmental performance facilitated by SDTC technologies allows governments to set new policy and to establish effective performance standards with the knowledge that technologies exist that can meet those standards. Through the SD Business Case<sup>TM</sup>--a proprietary business decision-making tool developed by SDTC-and stakeholder consultations, which bring together technology developers, industry, policy makers and government agencies into a dialogue, SDTC informs the development of appropriate policy and investment priorities.

<sup>11.</sup> Evaluation of the SD Tech Fund of Sustainable Development Technology Canada Second Interim Report – Detailed Report, June 1 2009, p 11)

<sup>12.</sup> http://rd-review.ca/eic/site/033.nsf/vwapj/R-D\_InnovationCanada\_Final-eng.pdf p. 110

<sup>13.</sup> OECD (2011) Studies on Environmental Innovation: Better Policies to Support Eco-Innovation http://www.oecd.org/document/34/0,3746,en\_2649\_34333\_47305250\_1\_1\_1\_1,00.html, (accessed September 2011) p. 299

## **SDTC Vision for the Future**

Clean technology is an increasingly important economic sector; however, it is still in the early stages and is subject to many drivers, including political, social, economic and technological influences. The successful development, demonstration and adoption of clean technologies is subject to numerous external factors, such as current and emerging regulatory requirements, business conditions (such as economic outlook, and energy pricing), and the competitive landscape.

In order to best serve its stakeholders and fulfill its mandate, SDTC must always operate in the present but with a vision of the future. This vision is informed by monitoring and understanding these key external factors. This includes identifying risks that may affect SDTC's ability to fulfill its mandate, by recognizing new opportunities and adapting as the cleantech landscape changes. This section will discuss SDTC's current vision for the future.

## SDTC Recapitalization is Critical to Government's Agenda

In 2011, SDTC celebrated its ten year anniversary. The \$590 million SD Tech Fund will be fully allocated in 2012. As has been outlined in this report, SDTC has enjoyed considerable success over the past ten years. While the funders, Board of Directors, Senior Management and staff have much to be proud of, there remains much work to be done. Without a renewed promise of financial support from the Government of Canada, SDTC will be unable to maintain the momentum it has established over the previous ten years and maximize results to Canadians.

It is SDTC's position, and with a considerable amount of third-party objective data on the quality and reality of SDTC's results, that it is the best instrument to ensure future success. SDTC is a unique private sector oriented entity, which responds rapidly and flexibly to the Government's agenda and delivers measurable results in the following key ways:

- SDTC's clean energy companies support Canada's energy export diversification agenda;
- SDTC's companies are export-oriented, thereby increasing Canada's export revenues and stimulating the Canadian economy;
- SDTC's portfolio adds value to Canada's natural resources strengthening productivity and competitiveness, thereby increasing profitability and reducing environmental footprint;
- SDTC's processes and culture are recognized as contributing strongly to Canada's Innovation Agenda; and
- SDTC has built momentum which, if left unsupported, would adversely impact Canada's competitive position globally as other countries are stepping up their commitments in this area.

Global demand for cleantech, which encompasses clean energy, is growing rapidly and many countries seek to gain share of this significant market opportunity. SDTC has laid the Canadian foundation to be competitive in many arenas (cleantech is a highly heterogeneous category targeting broad markets ranging from fossil fuels, to mining, forestry, agriculture, transportation, buildings, construction & infrastructure, and community-based solutions for the North). For Canada to proceed in improving the productivity of its economy and capturing its share of exports, we must maintain and build momentum based on the SDTC platform. Further, uncertainty around SDTC's long-term viability will result in reduced investment in and uptake of SDTCfunded technologies. Without the SDTC team around to broker the deals with other investors and multi-national corporations, portfolio companies will be left to struggle through this difficult part of the innovation ecosystem. This will negatively impact further success of SDTC portfolio companies, and will severely limit Canada's ability to compete in the \$4 trillion global cleantech market. Many countries (especially in Asia, Europe, and the United States) are making significant investments in cleantech innovation. Currently Canada is in danger of falling behind in this increasingly important and competitive sector. According to a 2011 report by the Cleantech Network, the U.S. is rapidly outstripping Canada in cleantech investment (see Figure 5 below). Insufficient cleantech funding will adversely affect the ability of key economic sectors to adapt to the realities of a global marketplace in which efficiency and sustainability are crucial for long-term viability



#### Figure 5 - North American Cleantech Investment 2002 - 2011

The Government of Canada has identified innovation as a key for improving Canadian productivity and competitiveness. The October 2011 report *Innovation Canada: a Call to Action* by the Review of Federal Support to Research and Development recognized the importance of the SDTC model in promoting the successful commercialization of Canadian innovation, stating that that "The commercialization model developed by Sustainable Technology Development Canada might be emulated."

Reinforcing this notion, in 2011, the Canada West Foundation published a report that stated "If [Canada] is to position itself successfully for a low-carbon transition, it needs to foster the commercialization of its energy innovations."<sup>14</sup> One way to do this, the report concluded is through the "continued (and expanded) funding of Sustainable Development Technology Canada (SDTC), which makes targeted investments in innovations with a specific emphasis on making them commercial."<sup>15</sup>

By granting recapitalization to SDTC, the Government of Canada has an opportunity to demonstrate its continued commitment to building a viable, competitive cleantech and clean energy industry in Canada, allowing Canada to remain competitive in the burgeoning, and increasingly important, global cleantech market.

<sup>14.</sup> Canada West Foundation (2012) *Cautious Optimism: Western perspectives on a low-carbon economy* http://cwf.ca/publications-1/cautious-optimism-western-perspectives-on-a-low-carbon-economy, p.

<sup>15.</sup> Canada West Foundation (2012) Cautious Optimism: Western perspectives on a low-carbon economy http://cwf.ca/publications-1/cautious-optimism-western-perspectives-on-a-low-carbon-economy

## **Evolving the SDTC Model**

As a not-for-profit foundation funded by the Government and operating in partnership with stakeholders in numerous sectors, SDTC's continued success is affected by many factors that are external to its control. In order to thrive in rapidly changing circumstances, SDTC continually explores new opportunities to develop an even stronger model to ensure that the continued development and adoption of Canadian clean technologies.

SDTC is consistently evolving, as is the economic landscape. Operating, funding, and returns models for Government entities must change. SDTC recommended this two years ago, requesting changes to its model. Since then, SDTC has developed a radically different and expanded vision that will enable it to deliver even greater returns to Canada at less cost to the Government.

As part of this evolution, SDTC has explored new ways of directing funds into the SD Tech Fund. The Foundation will continue to focus on securing private sector follow-on financing and becoming the partner of choice for large corporations looking to adopt innovative technologies. SDTC has been increasing its engagement with large corporations who are seeking a suite of technology options to increase the efficiency and profitability of their operations.

One proposed change would include the institution of a financial mechanism (equity through warrants) that would allow successful SDTC-funded companies that have surpassed certain commercialization benchmarks to return some funds back into SDTC. Such a structure would help to replenish the fund, perpetuating the success of the SDTC process and allowing for even greater return on public investment.

An additional returns-based mechanism is the development of a SDTC-managed fund that would co-invest with the private sector. Under this direct co-investment model, SDTC would match private sector investment in projects that have been identified and vetted by the venture capital community, Finance Canada, and SDTC. This model would provide rapid access to financing for globally competitive companies at a crucial point in their commercialization efforts, and enable more efficient syndication of investors and increase their capacity to win contracts in international markets. This would allow a more returns-oriented approach, demonstrating the robust capacity of the SDTC model to do more with less. Further, this will help boost venture capital performance in Canada, help address this policy gap, and lead to revitalizing the Canadian venture capital community. Note that cleantech represents about 20 percent of venture investment in Canada, just behind the ICT category.

## **Expanded Partnerships for Increased Results**

When SDTC was formed in 2001, clean technology was in its infancy. Today, it is a rapidly growing part of the Canadian economy and many new players have entered the space. In order to achieve its mandate, SDTC needs to engage with a wide variety of stakeholder communities who will each play a role in this emerging cleantech sector.

The consortium approach that is central to the SDTC model requires an active and expanding network of viable partnerships. Through its project-funding model SDTC has forged a network and developed a comprehensive proprietary database with more than 7000 entities across the country--helping to solidify Canada's cleantech infrastructure. One objective of this approach is to build and encourage innovative collaboration and partnering among private, academic and non-profit sectors. SDTC structures partnerships in a number of ways, including:

- 1. Co-funding demonstration partners, who work with SDTC at the technology development and demonstration stage by acting as a demonstration host or a co-investor for an SDTC-supported technology.
- 2. Follow-on financing partners work with SDTC at the commercialization stage by investing in an SDTC-funded company at the post-project stage.

3. Technology adoption partners (TAPs) work with SDTC at the stage of early market entry of SDTC supported technologies by incorporating the technology into the TAP's own business or providing it as a product or component of the TAP's product offerings to end-use customers. Some current TAPs include Bombardier Inc., Enbridge Inc., General Electric Corporation, and Ledcor Group of Companies.

SDTC has entered into partnerships around emerging clean technology opportunities with leading corporations such as Cenovus, Encana, and Veolia and is actively working with organizations such as organizations such as The Proctor & Gamble Company, Wal-Mart Stores Inc., Canadian Tire Corporation Ltd., and Loblaw Companies Ltd. To date, MOUs with corporations have led to \$22 million in investment into SDTC companies.

## **Relevance Across Government**

SDTC is funded by the Government of Canada and is accountable to Parliament through the Minister of Natural Resources. Environment Canada and Industry Canada are also key departments involved in the work of the Foundation. As clean technologies are adopted into all the major sectors of the economy, SDTC's involvement has increasing relevance to all levels of government across the country.

SDTC has contributed its cleantech expertise to many federal programs within Industry Canada, Foreign Affairs and International Trade, Transport Canada, Agriculture and Agri-Food Canada, Fisheries and Oceans, and National Defence. Also, it has worked with such federal partners as Export Development Canada (EDC).

SDTC supports numerous innovation initiatives and is complementary to programs across the federal government. As of June 30, 2012, SDTC has funded into 93 projects which have received upstream funding from the Government of Canada, including 26 that have received IRAP/NRC funding and 17 who have received NRCan/CANMET funding. SDTC assists by commercializing innovation arising from these departments, realizing value on the early-stage intellectual property that has been created.

SDTC will continue to work with Environment Canada and NRCan to strengthen the innovation ecosystem and demonstrate SDTC's critical value to federal officials within SDTC's two key departments and beyond.

Additionally, SDTC has strong relationships with provincial governments. SDTC has been involved in the establishment of three provincial funds and has collaboration partnership agreements with five provinces. SDTC has entered into partnership agreements and/or contributed to the establishment of cleantech funds in British Columbia, Alberta, Ontario, Quebec and Nova Scotia. These partnerships have enabled SDTC to establish a common dialogue on cleantech trends and opportunities, and led to an additional \$132 million in direct funding into SDTC supported companies.

SDTC has active, on-going agreements across Canada:

- Ontario's Ministry of Research and Innovation (MRI)
- British Columbia's Innovative Clean Energy (ICE) fund and BioEnergy Network (BCBN)
- Alberta Innovates, CCEMC, and Alberta Enterprise Corp.
- Quebec's Ministry of Economic Development and Innovation (MDEIE), and Energy Efficiency Agency (AEEQ)
- Innovacorp in Nova Scotia

## 1. About the Funds

Sustainable Development Technology Canada (hereafter referred to as SDTC and/or the Foundation) was established by the Government of Canada with the mission to "act as the primary catalyst in building a sustainable development technology infrastructure in Canada."

After a technology leaves the research stage, but before it is ready for commercialization, it often encounters a financing gap. At this stage, it is often difficult to secure funding due to financial and market risks related to the unproven nature of the technology. SDTC helps bridge this gap in two ways. Firstly, SDTC provides funding for projects that allow technologies to prove their value in a 'real world' demonstration. Secondly, SDTC works with these early stage companies to build their value proposition and strengthen their business. SDTC provides this funding from one of two funds totaling \$1.09 billion.

The first fund is the \$590 million SD Tech Fund<sup>TM</sup>, which is aimed at supporting the development and pre-commercial demonstration of clean technology solutions. The fund, established in 2001, is to direct a total of \$150 million to support technologies that address clean water and clean soil issues and the balance of the fund (approximately \$440 million) to support technologies that address climate change and clean air issues. The second fund, established in 2007, is the \$500 million NextGen Biofuels Fund<sup>TM</sup> (NGBF), which is aimed at supporting the establishment of first-of-kind large demonstration-scale facilities for the production of next-generation renewable fuels and co-products in Canada<sup>16</sup>

The Foundation's mandate, governance, operations, performance requirements, and accountability are defined in funding agreements that have been executed by the Foundation and the Ministers of both Natural Resources Canada (NRCan) and Environment Canada. Under the terms of the funding agreements, the Foundation is required to "provide a corporate plan as well as a summary of the corporate plan annually to the Minister." The *SDTC 2013 Corporate Plan*, of which this report is a summary, fulfills this obligation.

## 2. Performance Expectations

The Foundation ensures accountability through an extensive performance and evaluation framework known as an evaluation logic model, of which there is one for each fund. This model is designed to measure the Foundation's progress toward its primary goals—which consist of the overarching mission and the three supporting goals listed below—by identifying operational activities and assessing their results. The three supporting goals are as follows:

- a) Develop and demonstrate new sustainable development technologies related to climate change, clean air, clean water, and clean land, in order to make progress toward sustainable development;
- b) 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 and clean land; and,
- c) Ensure timely diffusion of new sustainable development technologies in relevant market sectors throughout Canada.

#### Compliance, Audit and Evaluation

As part of its transparency and accountability, SDTC is required to undergo a number of evaluation and auditing activities, which are specified in the funding agreements. To date, SDTC has participated in 7 audits and evaluations related to the SD Tech Fund<sup>TM</sup> and NGBF, and has participated in two audits conducted by the Commissioner of the Environment on Sustainable Development (CESD) on the Kyoto Implementation Act in 2009 and 2010. SDTC has received positive reviews from the multiple audits.

<sup>16.</sup> NGBF defines renewable fuels as any alternative to gasoline, diesel or heating oil that is derived from biomass. Next-generation renewable fuels means any Renewable Fuels derived from production pathways that are not widely commercially used. For greater clarity this refers to the use of (i) non- traditional renewable feedstocks such as lignocellulosic materials (including fast-growing grasses, agricultural residues and forest biomass); and (ii) non-conventional conversion technologies.

The most recent audit was the Value-For-Money (performance audit) undertaken by KPMG, on behalf of Natural Resources Canada, which was completed in July 2011. The audit report attests to the efficiency and effectiveness of SDTC's processes and reports favourably on the matter of reasonableness of SDTC's Operating Expenses.

A summary of the Treasury Board of Canada's evaluation of the role of foundations as public policy instruments is included in this report, demonstrating that SDTC's general management and overhead costs are significantly below the average observed across other foundations. This independent analysis confirms that SDTC is an effective instrument of Government.

## 3. Actions and Results – SD Tech Fund

Under the SD Tech Fund evaluation logic model, actions undertaken by the SD Tech Fund can be broken down into nine work scopes, or areas of activity, each of which supports one or more of the primary goals of the Foundation. The following sections will assess the actions undertaken by the Foundation between July 1, 2011 and June 30, 2012 (the reporting period) in each of these areas of activity.

## 3.1. Protect SDTC's Investment

To achieve its mandate and make prudent use of public money, SDTC must ensure that it invests in the right technologies with the right management under the right terms and conditions. Key highlights this year include:

#### 1. Process and schedule

#### Results

- Two funding rounds conducted totaling \$70 million in allocations
- 238 projects approved to date for a total of \$581 million of SDTC project funding
- 30 workshops and webinars delivered to build Canadian applicant capacity
- A regular review of projects facing difficulties with ongoing remedial action affecting \$32 million of allocations. These funds were made available to fund other projects.

#### **Planned Actions**

- As previously reported, SDTC has funds to conduct a partial round in the second half of 2012 and will require additional capital to fund new projects in 2013
- SDTC has launched a Virtual Incubator to engage entrepreneurs earlier in the funding cycle and provide focused guidance

#### 2. Project selection criteria

#### Results

- Continued delivery of Expert development webinars
- Ongoing outreach to ensure market relevance of selected projects

#### **Planned Actions**

- Continued in-house development to stay current with market needs
- Continued refinement of SDTC's expert roster to reflect portfolio and market needs

#### 3. Integrating funding with the financial sector

#### Results

- SDTC has continued its significant leverage of the private sector financing—with 81% of the non-SDTC project funding coming from the private sector
- SDTC-funded companies have attracted 65% of the \$126 million in venture capital funding that was invested in the cleantech sector in 2011.

#### **Planned Actions**

• Continued outreach to engage private sector in SDTC projects

### 3.2. Project Funding

As of June 30<sup>th</sup>, 2012, SDTC has funded 238 projects for a cumulative total of \$2.13 billion in total project value. SDTC has met all of its Funding Agreement allocation requirements for climate change, clean air, clean water, and clean soil, with 89 percent of the portfolio having two or more environmental benefits. SDTC has also met its requirements for funding \$50 million into the hydrogen economy, and \$50 million to cleaner fossil fuels. SDTC is currently capitalized to conduct only one funding round in the second half of 2012, and will require additional capital to fund new projects in 2013.

## 3.3. Attract Private Sector Capital to SDTC Portfolio Technologies

As of June 30<sup>th</sup>, 2012, SDTC has funded 238 projects for a cumulative total of \$2.13 billion in total project value. SDTC continues to grow its Follow-on Financing initiative, with 52 SDTC companies having raised an additional \$2.3 billion from the private sector which is entirely additional to the "in project" funding. In the past 12 months, follow-on financing levels have totaled \$519 million, representing the highest annual amount to date. Further, the international attractiveness of SDTC's funded companies has resulted in over 57 percent of this follow-on financing coming from sources outside of Canada. SDTC continued to demonstrate active involvement in venture capital, public market, and debt finance events, and intends to continue this involvement with tailored approaches to each asset class. SDTC has developed and in 2012/2013 intends to launch its Customer Relationship Management system to enable efficient matching between companies and investors.

### 3.4. Create Go-to-Market Consortia

As of June 30<sup>th</sup>, 2012, SDTC's portfolio comprised approximately 900 consortia partners. SDTC has worked with these partners as projects near completion to ensure timely diffusion into the market. SDTC's Technology Adoption Partnership initiative has engaged 35 multi-national enterprises that have subsequently entered into commercial discussions with SDTC portfolio companies. SDTC has also entered into various Memoranda of Understanding (MOUs) with provincial governments. Since 2003, provincial collaborations have resulted in \$132 million in funding into 69 SDTC projects. More recently, SDTC has begun similar MOUs with select Canadian companies. This has already resulted in \$37 million in transactions to date. SDTC will continue to engage technology adopters through this initiative as the momentum continues to develop.

### 3.5. Broker Non-Portfolio Projects

While not all projects meet SDTC's eligibility criteria, they nonetheless have a role to play in developing a sustainable technology infrastructure in Canada. SDTC has and plans to continue providing coaching and advice to these entrepreneurs, as well as directing them to other sources of funding (such as IRAP, NSERC, etc.).

## 3.6. Identify Solution to Adoption Barriers

In 2011/2012, SDTC participated heavily in the two major Federal Reviews on Innovation: the Review of Federal Support to Research & Development, and the Aerospace Review. Both of these reports support the use of SDTC as a policy solution to overcome existing commercialization barriers for innovation in Canada. SDTC is supported by its portfolio companies and by the multinational enterprises (who are adopters of these technologies) in its input into these two major reviews. In 2012/2013, SDTC will continue to identify market gaps and recommend policy solutions through follow-on work of the review panels.

### 3.7. Workshops and Outreach

SDTC remained active in key cleantech-related events, being a speaker at 21 events between July 2011 and June 2012. SDTC held 75 meetings with ministers, deputy ministers and other senior government officials to increase their awareness of the importance of the cleantech sector to Canada. SDTC will continue to engage a broad stakeholder base throughout 2012/2013 to continue the development of a sustainable technology infrastructure in Canada.

### 3.8. Communications

SDTC remains focused on providing recognition to Canada for its support of the Foundation. These are reflected in the eleven events with federal ministers conducted between July 2011 and June 2012. Further, SDTC appeared in 2,682 articles across 22 countries. SDTC will continue to utilize a variety of avenues to reach key audiences, including funding announcements for the Ministers of Natural Resources and Environment Canada.

### 3.9. Business Case for Sustainable Development

Between July 2011 and June 2012, SDTC identified the Aerospace, Defense and Security industry as the focus of a future SD Business Case, given this industry is in transition. ADS companies have engaged SDTC in strategic business planning exercises and have partnered with SDTC's portfolio companies. This business case will examine an overall strategy for Canada to leverage its defense procurement—elements of which SDTC has already contributed into the two major Federal Reviews.

## 4. Actions and Results – NextGen Biofuels Fund

The NextGen Biofuels Fund (NGBF), founded in September 2007, supports the establishment of first-of-kind large demonstration-scale facilities for the production of next-generation renewable fuels and co-products in Canada.

### 4.1. 2011/2012 Results

Having navigated a challenging industry, NGBF completed due diligence and secured approval from SDTC's Board for three Applications for Funding between July 2011 and June 2012. SDTC also entered into one Preliminary Contribution Agreement (PCA), and was in the process of negotiating two additional PCAs as at June 2012. Five Applications for Funding (AFFs) were received over the same period. NGBF continues to receive a steady flow of Indications of Interest. The NGBF Interim Evaluation was launched, and quarterly meetings with key departments (NRCan, Environment Canada, and Agriculture Canada) have been conducted.

## 4.2. 2012/2013 Planned Actions

In 2012/2013, NGBF will focus on final investment decisions for three projects, four front-end project development decisions, and four preliminary contribution agreements. NGBF will also finalize the Interim Evaluation per the NGBF Funding Agreement. Targeted outreach activities will be conducted in order to maintain a healthy deal flow.

## 5. Financial Plan

## 5.1. Grants

SDTC continues to operate to distribute the funds in an effective and efficient manner, fulfilling the mandate it has been given. As of June 30, 2012, the investment portfolio for the SD Tech Fund had an overall market value of \$245 million while the NGBF had \$58 million. It should be noted that NGBF funds are obtained from the Government of Canada according to cash flow requirements, as per the NGBF Funding Agreement (both amounts are after operational expenses and project disbursements). These portfolio balances are comprised primarily of project funding which has been allocated, but not yet disbursed, as well as some accrued interest.

## 5.1.2. Budget

The planned operating expenditure budget for the SD Tech Fund is approximately \$11.2 million in 2013, and the preliminary budget for 2014 is \$9.1 million. For the NGBF, the planned operating expenditure budget for 2013 is \$3.0 million and the preliminary expenditure budget for 2014 is \$3.4 million. The human resources required to undertake the NGBF Funding Agreement obligations are available to do so, cost effectively, because for the majority of the time these resources are directed towards the management and operations of the SD Tech Fund. This reflects the fact that the NGBF is predicated on the existence of the SD Tech Fund and is allocated a portion of SD Tech Fund overhead based on usage of staff.

### 5.3. Allocation and Disbursements

In 2011, SDTC disbursed \$82 million of allocated funds, the highest amount of any year. Annual project disbursement payments are projected to be \$90 million in 2012, between \$95 million and \$115 million in 2013 and between \$80 million and \$100 million in 2014.

The disbursement timing is driven by the applicant's ability to meet planned schedules. As of June 30, 2012, the SD Tech Fund allocation was \$581 million. SDTC will require additional capital to be able to allocate funds beyond 2012.

As for the NGBF, approved projects are projected to require \$300 million before the end of March 2017, which is the end of the disbursement period as per the NGBF Funding Agreement. Two additional Applications for Funding (AFF), if successful, would require allocation of the remaining \$200 million of the NGBF funds in 2012/2013.

## 6. **Risks and Mitigation**

As part of its corporate risk management strategy, SDTC regularly identifies, assesses and monitors existing and emerging business and organizational risks. For each of these risks, SDTC develops and, as necessary, implements a mitigation strategy. Current issues that may pose risks to the SD Tech Fund in the upcoming 12 months (and which are discussed at length in the body of the report) include:

- Results and Economic Risks to Canada,
- Canadian Business Productivity and Competitiveness Risk,
- Economic and Market Uncertainty Risk (which has now been reduced substantially),
- Regulatory and Policy Risk (which has also been reduced substantially),
- Evaluation Risk; and,
- Governance Risk

Current issues that may pose risks to the NextGen Biofuels Fund include:

- Technology and Scale-up Risk,
- Federal Biofuel Policy Risk,
- Economic Climate Risk,
- Regulatory Harmonization Risk,
- Natural Gas Risk; and,
- Financing Risk

The Foundation will continue to work with stakeholders—including technology developers, industry, financial organizations, and governments—to identify these risks and to develop and implement mitigation strategies.

## 1. SDTC Overview – Mission and Objectives

Sustainable Development Technology Canada (hereafter referred to as SDTC and/or the Foundation) was established by Bill C-4 of the First Session of the thirty-seventh Parliament of Canada and was incorporated as a non-profit corporation on March 8, 2001. The mission of the Foundation is to "act as the primary catalyst in building a sustainable development technology infrastructure in Canada."<sup>17</sup>

Every new invention moves through a set of distinct stages. Between the research stage and the commercialization stage, lie the development and demonstration stages. These are often characterized by a financing gap (figure 6). At these stages, it is difficult to secure funding due to financial and market risks related to the unproven nature of the technology. That gap has proven to be a significant barrier to market entry for many Canadian developers of sustainable development technologies.

SDTC helps to bridge this gap. Occupying a position in the innovation chain between the research and the commercialization phase, SDTC helps innovators to carry out the critical "real-world" demonstration of their clean technologies to attract follow-on financing and achieve market entry. It accomplishes this by providing funding for commercial demonstration projects from two separate funds totaling \$1.09 billion. These funds are complementary and address sequential gaps in the innovation chain.

### Figure 6: The Pre-Commercial Funding Gap



<sup>17.</sup> In the context of this discussion, "sustainable development" refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainability is based on three mutually reinforcing considerations: environmental protection, economic development, and social development.

The first fund, the \$590 million SD Tech FundTM, is aimed at supporting the development and pre-commercial demonstration of clean technology solutions (figure 7). Clean technologies are products and processes that contribute to clean air, clean water and clean soil, that mitigate climate change and that improve the productivity and global competitiveness of Canadian industry. The SD Tech Fund is to direct a total of \$150 million to support technologies that address clean water and clean soil issues and the balance of the fund (approximately \$440 million) to support technologies that address climate change and clean air issues.<sup>18</sup>

#### Figure 7 - SDTC's Role in Bridging the Pre-Commercial Funding Gap



The second fund is the \$500 million NextGen Biofuels Fund<sup>™</sup> (NGBF), which supports the establishment of first-of-kind large demonstration-scale facilities for the production of next-generation renewable fuels and co-products in Canada. These projects have very high capital expenditure (high capex) requirements and, therefore, are more exposed to risk of financial uncertainty, making it particularly difficult to secure financing in the development and demonstration phase (figure 8).

The NGBF provides funding that helps large-scale demonstration projects to overcome the high-capex funding gap (figure 9). The fund will help improve sustainable development impacts that arise from the production and use of renewable fuels and will help Canada sustainably meet potential future expansions of its renewable fuels standard (RFS).<sup>19</sup> Another purpose of the NGBF is to encourage the retention and growth of technology expertise and innovation capacity for production of next-generation renewable fuels in Canada.

<sup>18.</sup> It should be noted that In June 2010, SDTC received Treasury Board approval to increase allocations to clean climate/clean air technologies from the original amount of \$350 to \$400 million and to reduce clean water/clean soil technology allocations from \$200 million. This re-allocation was made at the request of SDTC in response to significant market demand for the SDTC Funds to address climate change and clean air technologies.

<sup>19.</sup> The Renewable Fuels Regulations, published on September 1, 2010 in the Canada Gazette, Part II, require an average renewable fuel content of five per cent in gasoline starting December 15, 2010. The Regulations also require fuel producers and importers of diesel fuel to have an average annual renewable fuel content equal to at least 2% of the volume that they produce and import.

#### Figure 8 - The High-Capex Funding Gap



#### Figure 9 - SDTC's Role in Bridging the High-Capex Funding Gap



While SDTC is funded by the Government of Canada, it is not an agent of Her Majesty. SDTC has an independent governance structure and is accountable to Parliament for the grants it receives through the Ministry of Natural Resources Canada (NRCan). The Foundation's mandate, governance, operations, performance requirements, accountability and relationship to the Government of Canada are defined in the funding agreements that have been executed by the Foundation and the Ministers of both NRCan and Environment Canada. Because the vast majority of SDTC's lead companies are small-to-medium enterprises (SMEs), the Foundation's work has considerable relevance to innovation and business; as a result, it is also influenced by Industry Canada's policy initiatives.

## 1.2 Mission Statement and Supporting Goals

The mission of the Foundation is to "act as the primary catalyst in building a sustainable development technology infrastructure in *Canada.*" Underlying this objective is the intent for the Foundation to become the nationally recognized centre of a network of stakeholders and partners who work in the area of sustainable technology development. Inherent in this is SDTC's role in the demonstration and diffusion of Canadian innovations. The Foundation's purpose is to both fund projects and to build a critical mass of capability in this area of innovation, thereby contributing to the creation of a cleantech infrastructure.

The intent behind the mission statement is to build a critical mass of sustainable development technology organizations. These organizations include entrepreneurs and innovators from all sectors who create new sustainable development technologies and work to transform the marketplace to increase the number of adopters and users of these technologies. Through such efforts, Canada will become more environmentally sustainable and gain economic strength, achieving benefits that flow to Canadians in general. In this way, the groundwork for a fledgling sustainable development technology infrastructure will be laid.

The four overarching goals of the Foundation consist of the mission statement and the three elements cited as the "Purpose of the Fund" in Article 2 of the Funding Agreement.

Goal A: Develop and demonstrate new sustainable development technologies related to climate change, clean air, clean water and clean soil in order to make progress toward sustainable development.

**Goal B:** 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, and clean soil.

Goal C: Ensure timely diffusion by funded recipients of new sustainable development technologies in relevant market sectors throughout Canada.

## 1.3 The SDTC Corporate Plan

Under the terms of the Funding Agreement, the Foundation is required to "provide a corporate plan as well as a summary of the corporate plan annually to the Minister."<sup>20</sup> This report is intended to fulfill this obligation. It includes a number of items outlined in the Funding Agreement, including:

- a) Short and medium term outcomes according to the Foundation's mandate;
- b) References to the Foundation's previous year's corporate plan, including results of initiatives introduced in that plan;
- c) Details of the Foundation and its management, including forecasted expenditures and revenues;
- d) Planned activities for the upcoming year and the anticipated results of those activities; and,
- e) Risk assessments and mitigation strategies.

SDTC's approach in the development and execution of this report reflects its intention to be transparent in its actions and performance, accountable to the Government and the public, and responsible for maintaining uncompromising corporate governance. These values are ingrained in the organizational culture of the Foundation and reflect the organization's commitment to ensuring the effective and efficient use of public funding.

<sup>20.</sup> Funding Agreement Three Pertaining to the Sustainable Development Technology Fund, section 10.06

## 2. Performance Expectations

This report reflects SDTC's commitment to the effective, efficient use of public funding through demonstrable transparency, accountability and good governance. The Foundation measures its performance against these core values through the implementation of internally driven evaluation mechanisms, as well as through audits and evaluations.

## 2.1. Success Criteria and Measurements: Evaluation Logic Model

The funding agreements require that the Foundation be accountable to the Government of Canada. The Foundation ensures this accountability through performance and evaluation frameworks known as evaluation logic models. The logic models are designed to measure the Foundation's progress toward its primary goals—which consist of the overarching mission and the three supporting goals outlined in section 1.3 above—by tracking the outputs and outcomes of its activities.

The evaluation logic model for the SD Tech Fund (Figure 10) is organized into nine elements or work scopes, each of which is intended to contribute to the fulfillment of one or more of the four goals of the Foundation. Each work scope is then broken down according to the actions taken within it, and then assessed according to the results of those actions.

Similar to the SD Tech Fund, the NGBF has an evaluation logic model (Figure 11) that serves as an operational framework and planning tool that describes the activities to achieve the three primary goals of the fund and support the mission of the Foundation. The activities depicted within the evaluation logic model are organized into seven elements or work scopes. Each of these seven elements is associated with one or more of the NGBF's goals as described by the mission statement.

The logic models illustrate how each activity contributes to the fulfillment of the overarching mission and the three supporting goals, and depict the links between the activities and their corresponding long- and short-term outcomes. These outcomes are measured as time progresses to determine SDTC's success in achieving its purpose and mission. The evaluation logic models are also used at the operational level to help define the roles, responsibilities, and annual goals and objectives for SDTC management and staff. Outputs follow activities in the evaluation logic model.

Figure 10 - SD Tech Fund Evaluation Logic Model

### Mission Statement

Goal A

SDTC will act as the primary catalyst in building a sustainable development infrastructure in Canada

## **Purpose of the Fund**

### Goal B

Develop and demonstrate new sustainable development technologies (SDTs) related to climate change, clean air, clean water and clean land, in order to make progress towards sustainable development.

Work Scope:



## Goal C

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 SDTs with respect to climate change, clean air, clean water and clean land

Work Scope:



Goal D

Ensure timely diffusion by funded recipients of new SDTs in relevant market sectors throughout Canada.

Work Scope:



## Work Scope

## Protect SDTC's Investment

Provide due diligence screening and excellence in contract definition and project management. Integrate funding activities with the financial sector and, where appropriate, complement other programs.

#### **Project Funding** 2

Invest in creative collaborative partnerships (representing multiple players in the innovation chain) that enable timely development and demonstration of technology solutions for climate change, clean air, clean water and clean land.

3

## **Attracting Capital to Clean Tech**

Attract additional financing into the clean technologysector and increase the receptivity of the investment community for sustainable development.

#### 4 Create Go-To-Market Consortia

Build and encourage innovative collaboration and partnering among private, academic and non-profit sectors.

#### **Broker Non-Portfolio Projects** 5

Broker relationships that accelerate the dissemination of SDTs towards the marketplace.

#### **Identify Solutions for Barriers to Adoption** 6

Report and communicate to stakeholders and partners, including identification and advocacy around market barriers, energy policy, capital availability, product codes, and standards and regulation.

#### (7) Outreach

Increase capacity within economic sectors for accessing project funding and improving their managementcapability.

#### Communications 8

Educate, raise awareness and promote benefits of SDTs.

#### **Business Case for SD** 9

Build the business case for SDTs and derive a national strategy for sustainable development (SD).



Figure 11 : NextGen Biofuels Evaluation Logic Model

**Mission Statement** 

Purpose of the Fund

## NGBF Purpose (c)

Encourage retention and growth of technology expertise and innovation capacity for the production of next-generation renewable fuels in Canada

Work Scope:



NGBF Purpose (a)

Facilitate the establishment of first-of-kind large demonstration-scale facilities for the production of next-generation fuels and co-products

Work Scope:

234567

## NGBF Purpose (b)

Improve the sustainable development impacts arising from the production and use of renewable fuels in Canada

Work Scope:



## **Activities/Work Scope**

### Outreach

Identify and recruit candidate technologies from international outreach and SD Tech Fund.

## 2 Develop SDTC Knowledge Base

Collect and conduct biofuels industry studies, identify and maintain roster of experts.

## Select Qualifying Projects

Guide and advise proponent. Proponent develops Application for Funding (AFF). Conduct due diligence review of AFF, including eligibility criteria and technology readiness.

## Participate in Project Assurance Process for Pre-Construction Phases

Monitor, advise, assist planning. NGBF expert reviewers conduct due diligence review of stage report for funding decision, provide recommendations to Project Review Committee and Board for decisions.

## 5 Contribute to Structuring the Project Financing

Advise and assist structure of financing.

## 6 Participate as an Active Investor in Construction, Commissioning and Plant Operations

Monitor, advise assist, identify barriers, contribute to solutions.

## Repay/Close-Out

Plant repays NGBF investment and/or operates for 10 years.

## SDTC Mission

SDTC will act as the primary catalyst in building a sustainable development infrastructure in Canada



## 2.2 Compliance, Audit, Evaluation and Public Accountability

As part of its transparency and accountability, SDTC is required to undergo a number of evaluation and auditing activities, which are specified in the funding agreements. SDTC has received positive reviews from the multiple audits and evaluations of the SD Tech Fund, including:

- 2005 Compliance audit (initiated by NRCan)
- 2006 Performance audit by the Commissioner of the Environment and Sustainable Development (CESD), a division of the Office of the Auditor General (OAG)
- 2006 First interim evaluation (mandated by the Funding Agreement)
- 2007-Treasury Board Secretariat Evaluation of Foundations
- 2009 Second interim evaluation (mandated by the Funding Agreement)
- 2009 Cost-benefit analysis (part of the second interim evaluation)
- 2010 Value-for-money (performance) audit (initiated by NRCan, completed in 2011)

The funding agreement under which the NGBF was established has provisions for compliance audits, performance audits, and interim evaluations (which are due in 2012, 2017, and 2022). To date, the NGBF has contributed to CESD's audit of Kyoto Implementation Act in 2009 and contributed to the CESD's audit of Kyoto Implementation Act in 2010.

Each year, in accordance with its requirements, the Foundation submits an annual report, an annual report supplement, and a corporate plan to Parliament via the Minister of Natural Resources.

The most recent audit was the Value-For-Money (performance audit) undertaken by KPMG, on behalf of Natural Resources Canada, in 2010/11. The audit report attests to the efficiency and effectiveness of SDTC's processes, as demonstrated in the following findings:

- "SDTC uses efficient and effective mechanisms to align funding decisions and organizational priorities with stakeholder needs and with the Fund's stated objectives."
- "SDTC's processes for assessing and approving applications are, in all significant respects, efficient and effective, and are adhered to in practice."
- "SDTC has implemented and follows a risk-based approach to monitoring and follow up on the progress of funded projects."

Specifically on the matter of reasonableness of SDTC's Operating Expenses the KPMG report finds that:

- "SDTC's operating expenses are consistent with the objectives of the SD Tech Fund<sup>TM</sup> and that SDTC's
  proportion of operating expenses to allocated funds and funds disbursed are comparable to those of
  other similar organizations."
- "A high level of effort has been required for capacity building, providing support to applicants and recipients, as well as outreach and communication activities. These activities have contributed to increasing industry capacity and the likelihood of longer term project success."
- "SDTC has established budgets and allocated resources for activities that are consistent with the stated objectives in Funding Agreement #3."
- "In comparing the proportion of common categories of SDTC's operating costs to that of other foundations, we noted that SDTC's proportions were within the range of other organizations."

- These plans include initiating discussions with the federal government to discuss options for reducing compliance costs and reviewing spending and purchasing processes to reduce lifecycle costs by improving process efficiencies."
- "SDTC's cumulative average ratio of operating expenses to disbursements of 30% is considerably lower than that of" one organization and is comparable to another "when considering its program delivery model..."
- "In summary, based on our benchmarking and examination of SDTC's operating costs, the nature of the costs incurred are consistent with the stated objectives of Funding Agreement #3, and the relative proportion of operating costs to amounts disbursed and allocated are comparable with those of other similar organizations."

The auditor was in agreement with SDTC that the use of interest income to cover operating expenses was a reasonable approach to managing the issue, as evidenced below.

• "It is noted that, despite this adverse variance in operating expenses, SDTC is expected to have sufficient cash flow to cover their total estimated operating expenses through to the end of the Agreement and to disburse at least \$550 million to projects and, as a result, there is no going concern issue. <sup>I</sup> Going concern refers to a generally accepted accounting principle that the organization will continue to be viable and continue its operations to meet its objectives and to fulfill its commitments, and as such, has neither the intension nor the need to liquidate or curtail materially the scale of its operations"

## 2.3 Comparison of the Relative Breakdown of Operating Expenses of SDTC and Other Foundations

In 2007, the Treasury Board of Canada (TBS) undertook an evaluation of the role of foundations as public policy instruments. This evaluation showed the relative breakdown of operating expenses of a range of foundations, including the average share of total operating expenses across five categories, as well as the range observed.

As demonstrated in the table below (Table 1), when compared with the average operating expenses for a selection of Canadian foundations (as presented in the *TBS Evaluation of Foundations*), 50% of SDTC's operating expenses are directly related to program management and operations to develop and maintain a healthy portfolio of diverse SD technologies and comparable to other foundations. Its general management and overhead costs are significantly below the average observed across other foundations (34% relative to the average of 41%). The KPMG Value for Money Audit and resulting report also uses this TBS evaluation as a point of reference and arrived at the same conclusions.

#### Table 1 Comparison of the Relative Breakdown of Operating Expenses of SDTC and Other Foundations

Cost Categories <sup>1</sup>	SDTC <sup>2</sup>	TBS Evaluation of F	oundations <sup>3</sup>
	5 yr Actual Average	Average Share of Total Operating Expenses	Range
Program Management and Operations	51%	46%	15%-55%
General Management and Overhead	34%	41%	27%-70%
Governance Activities	7%	5%	2%-9%
Investment Management Fees	6%	6%	1%-12%
Amortization of Capital Assets	2%	2%	1%-4%

Note 1: These operating expense categories are those represented in Treasury Board Secretariat Evaluation of Foundations http://www.tbs-sct.gc.ca/report/orp/2007/ef-fe/ef-fe-eng.asp, Exhibit VI-2, p42 (2007).

Note 2: This data shows the five year average for SDTC's actual operating costs from 2006 – 2010, re-categorized to align with the TBS Evaluation of Foundations categories.

Note 3: This information represents the simple average of each foundation's cost mix over the most recent 5 years of financial data, as specified in the *TBS Evaluation of Foundations Report*.

## 3. SDTC Actions and Results - SD Tech Fund

The \$590 million SD Tech Fund supports the development and pre-commercial demonstration of clean technology solutions, products and processes that contribute to clean air, clean water and clean soil, and that mitigate climate change.

The following sections (3.1.1 through 3.1.9) correspond to the work scopes outlined in the SD Tech Fund Evaluation Logic Model and will discuss the activities that SDTC undertook for each work scope of the SD Tech Fund evaluation logic model between July 1, 2011 and June 30, 2012 (also referred to as the reporting period), as well as the short-, medium-, and long-term outcomes of those activities. They will also discuss actions that are anticipated to be undertaken from July 1, 2012 through June 30, 2013.

## 3.1. Protect SDTC's Investment

**Objective:** Provide due diligence screening in the project application and acceptance process, and excellence in contract definition and project management. Integrate funding activities with the financial sector and, where appropriate, complement other programs to facilitate co-funding and follow-on funding opportunities for our applicants. Facilitate co-funding and follow-on funding opportunities by leveraging our due diligence expertise to accelerate investment by others.

To achieve its mandate and make prudent use of public money, SDTC must ensure that it invests in the right technologies with the right management under the right terms and conditions. This is generally conducted through several processes or mechanisms, namely:

- I. Process and schedule;
- 2. Project selection criteria; and,
- 3. Integrating funding with the financial sector.

These will be discussed in the sections that follow.

### 3.1.1 Process and Schedule

Between July 1, 2011 and June 30, 2012, SDTC completed two funding rounds and approved funding for 23 projects. During this period SDTC allocated \$70 million of project funding. From 2002 through June 30, 2012, SDTC placed 20 rounds of funding calls, 19 of which will have been processed to the Board-approval stage by the end of 2012. To date, 238 projects have been approved for funding by SDTC and are at different stages of contracting and/or delivery, for a cumulative total \$581 million of SDTC project funding.

Over the past year, SDTC continued to expend significant time, effort, and resources on outreach initiatives to increase awareness of the SD Tech Fund investment priorities, application process, and screening criteria. This has resulted in continually stronger applications in each round.

Applicant outreach activities in 2011/12 included speaking at targeted events for entrepreneurs, focused advertising online and in print publications, and leveraging marketing channels from regional partnerships with innovation centres, and using industry associations and online newsletters to syndicate SDTC's biannual call for SOIs to a broad audience. SDTC has made a concentrated effort to target applicants in Canada's eastern and northern regions. During this period SDTC delivered 30 workshops and webinars, attracting over 1,000 stakeholders and engaging 34 regional partnerships. This activity lead to over 1,000 inquiries to the SD Tech Fund and resulted in 232 Statements of Interest for a total of \$ 581 million in funding requests.

Outreach efforts were supplemented by an increase in the level of pre-application screening to ensure that only applicants who most closely fit the mandate and those who have technologies that fall into SDTC priority investment areas or who offer disruptive clean technologies apply. For example, SDTC conducted "deal-pitch" sessions hosted by its innovation centre partners to provide their deal flow to SDTC.

Often, an applicant's technology has strong potential but the application has some shortcomings, such as lacking clarity and/or completeness, the consortium is incomplete or inappropriate, or the path to securing project funding is not in place. In such cases, SDTC works with the applicant to address those issues and invites the applicant to resubmit the application for further consideration. Of projects funded between July 1, 2011 and June 30, 2012, 6 were resubmitted from previous rounds.

To ensure that funds continue to be made available only to the most viable projects, SDTC periodically assesses portfolio risk and adjusts its contributions accordingly. As such, in 2011/12, the Foundation conducted a comprehensive review of projects that were unable to proceed as initially planned by the lead applicant and its consortium. This review resulted in SDTC identifying portfolio projects that were deemed to be unable to proceed to contracting, required termination due to non-performance or lack of funding, were de-scoped through a project modification, or reached the end of their period of funding. This made \$32 million available for re-allocation to additional project, however, the fund will still be fully allocated in 2012.

#### Planned Actions – 2012/13

SDTC is currently capitalized to conduct a smaller-than-usual funding round in the second half of 2012, and will need additional capital to fund new projects in 2013.

SDTC has identified there is an opportunity to increase SOI quality through earlier and more rigorous pre-screening, and enhanced guidance for entrepreneurs with high potential innovation. As such, SDTC plans to launch the SD Tech Fund Virtual Incubator – a new year round capacity building program to prepare targeted entrepreneurs for the SOI. The program will utilize a rigorous pre-screening function to identify disruptive innovation with alignment to SDTC investment priorities, off-ramping technologies earlier that do not meet the mandate.

The program will also engage entrepreneurs with innovative technologies earlier into the SD Tech Fund Virtual Incubator providing focused guidance for a compelling SOI submission.

### 3.1.2 Project Selection Criteria

Project selection is a competitive process based on technology performance, market/business potential, and environmental benefit. SDTC's internal evaluations are supplemented by sector experts who are trained in the Foundation's processes to apply high quality standards and deliver objective evaluations.

In 2011/12, SDTC continued the delivery of expert development webinars to its new and existing reviewers, educating them on the SDTC application process, selection criteria, and best practices. The expert workshops are credited with continually improving the quality of the reviews presented to the Investment Committee and the Project Review Committee for consideration.

SDTC routinely conducts outreach, such as workshops and conference participation, to build and consolidate the knowledge of sustainable development technologies in Canada. SDTC continues to evaluate and improve its processes based on stakeholder input, market drivers, and efficiency needs.

#### Planned Actions – 2012/13

The Foundation will continue to screen projects in accordance with established project screening criteria, and will continue to use sector experts trained in the Foundation's processes to augment SDTC's in-house expertise. The Foundation will continue to stay current with the needs of industry and ensure that its roster of experts is knowledgeable and able to evaluate the increasing breadth of technologies brought forward to SDTC. SDTC has continued to attract a high caliber of expert reviewers who undertake the important job of proposal review and identify with the mandate of SDTC.

## 3.1.3 Integrate Funding with the Financial Sector

Under the terms of the Funding Agreement, SDTC may contribute up to 33 percent of project funding, on average, across its portfolio of funded projects and up to 50 percent of funding for any one project. This reduces the Foundation's risk and encourages faster uptake of project technologies into the market place by engaging the financial community early in the commercialization process.

SDTC continues to achieve measurable success with respect to leveraged funding. It has successfully encouraged private industry to invest and share in the financing of over 238 projects funded to date. Of the \$2 billion of portfolio project funding invested to date, SDTC has allocated \$581 million, or 27 percent, while other funders have invested \$1.6 billion, or 73 percent. SDTC has maintained its contribution at less than 30 percent since inception.

Of particular note is that 81 percent of the leveraged funding comes from the private sector, demonstrating that industry considers these technologies to be good investment opportunities. This is further supported by the allocation of venture capital in Canada. Venture capital investment in the energy and environment sector in Canada from July 1, 2011 to June 30, 2012 was \$126 million. To the end of 2011, approximately 65 percent of these dollars were invested in companies that had previously been allocated funding from SDTC.

#### Planned Actions 2012/13

SDTC will continue to create awareness and understanding of the potential benefits to the private sector of investing in clean technology projects. The Foundation will also continue to engage private sector financial organizations and individuals, provincial and federal government programs, and strategic investors to provide project funding for applicant consortia. This will be accomplished, at least in part, through the outreach and communications that are discussed in subsequent sections of this report.

### 3.2 Project Funding

**Objective:** Invest in creative collaborative partnerships, representing multiple players in the innovation chain that enable the timely development and demonstration of technology solutions for clean air, GHG reduction, clean water and clean soil.

As of June 30, 2012, SDTC has funded 238 projects for a cumulative value of \$2.13 billion. The Funding Agreement specifies that the Foundation must allocate \$440 million to support projects that meet the SD Tech Fund objectives associated with climate change and clean air. Of these, 80 percent are to be primarily climate change projects and 20 percent primarily clean air. SDTC has achieved these targets.

As of June 30, 2012, SDTC has funded 238 projects for a cumulative value of \$2.13 billion. The Funding Agreement specifies that the Foundation must allocate 80 percent (approximately \$350 million) of its non-soil and water funding to projects which are to be primarily related to climate change and 20 percent (approximately \$90 million) to projects which are primarily related to clean air. SDTC has achieved these targets.

In 2005, SDTC's mandate was expanded to include a \$150 million allocation for technologies that primarily address issues related to clean water and clean soil. To date, SDTC's work with industry has led to 62 clean water/clean soil projects receiving funding approval representing \$120 million in allocation. Of these, seven projects totaling \$11 million were approved for allocation between July 1, 2011 and June 30, 2012. Currently, 43 percent of SD Tech Fund projects have clean water and/or clean soil benefits.

In addition to these targets, SDTC is required to allocate at least \$50 million to projects that focus on the development and demonstration of technologies related to clean fossil fuels and \$50 million for projects related to hydrogen. As of June 30, 2012, SDTC is on track to meet or exceed each of these requirements.

#### Planned Actions 2012/13

SDTC is currently capitalized to conduct one funding round in the second half of 2012, and will need additional capital to fund new projects in 2013.

### 3.3 Attract Private Sector Capital to SDTC Portfolio Technologies

**Objective:** Attract additional financing into the clean technology sector and increase the receptivity of the investment community for sustainable development.

To increase the receptivity of the investment community to clean technologies, and to support technology developers in taking their products to commercialization, SDTC engages the finance community on economic opportunities within the cleantech sector. SDTC does this in a number of ways, including: preparation and presentation of cleantech-related information to the investment community, development of case studies, analysis of investment trends, customized briefing sessions for the financial sector, and speaking engagements at key conferences directed at the investor audience.

In 2009, SDTC launched the Follow-on Financing Program, the goal of which is to secure financing for SDTC portfolio companies to assist with commercialization of their technologies on completion of the SDTC project. SDTC project technologies that are close to completing the demonstration phase and moving into commercialization have received substantial follow-on financing from the private sector. This represents a double leveraging of public funds, the first of which comes from project consortia partners and the second of which is provided by follow-on funders.

As of June 30, 2012, 52 companies, into which SDTC has invested \$158 million, have raised \$2.3 billion in follow-on financing. Over 57 percent of this follow-on financing has come from outside of Canada, with 77 percent of that portion coming from the United States. Over the past twelve months, follow-on financing levels have increased, with a 12-month total of \$519 million, the highest level to date.

SDTC conducted a number of outreach activities intended to identify and engage a wide range of investors spanning different asset classes (such as, venture capital, public market, and debt finance) and geography. This included representation at a number of workshops and conferences organized by and/or participated in by SDTC. These included:

- TSX-SDTC Investor Days (Toronto);
- Banff Venture Forum;
- Canada Financing Forum (Vancouver);
- San Francisco Cleantech Forum; and,
- Capital Connection events in Toronto, Vancouver and Montreal.

#### Planned Actions 2012/13

SDTC will continue to cultivate the pipeline of follow-on financing deals built over the last two years, while implementing more specialized and sophisticated techniques to build SDTC's capacity to facilitate follow-on financing.

SDTC will further tailor its approach to specific investment asset classes. The Foundation will stage the annual Cleantech Venture and Innovation Summit in Calgary. SDTC will also go live with a customized follow-on financing module of the Foundation's recently implemented customer relationship management (CRM) system, to enable the organization to more efficiently match companies with investors, measure performance and build capacity to offer additional services to the portfolio companies.

## 3.4 Create Go-to-Market Consortia

**Objective:** Build and encourage innovative collaboration and partnering among private, academic and non-profit sectors.

SDTC assists applicants both within their project and after their demonstration projects have completed and they are preparing to enter the market. During the project phase, SDTC helps applicants to strengthen their value propositions by identifying additional consortium partners, particularly technology end users, as well as stakeholders from industry, the financial community, academia, not-for-profit organizations and federal or provincial governments. These partners add a variety of critical skills, experience and expertise, and financial contributions to projects, thereby helping to leverage the Foundation's efforts. As the project nears completion, SDTC's Technology Adoption Partnership initiative facilitates strategic partnerships between SDTC portfolio companies and corporate entities that have the capacity to accelerate the market entry of the newly demonstrated technology. These go-to-market alliances are structured by the strategic partners for end use adoption, and/or bundling with their own offerings for delivery, or license, to other third parties.

The SDTC portfolio of companies comprises approximately 900 consortia partners who are directly involved in the 228 projects currently funded by SDTC. This is an increase from the previous reporting year, during which approximately 850 organizations were directly involved in projects then funded by SDTC. SDTC will continue to integrate the creation of go-to-market consortia into all of its primary activities. In addition, the Foundation will continue to provide value-added services to build and strengthen consortia and to increase the likelihood of successful market entry.

In 2011/12, SDTC continued to expand the Technology Adoption Partnership program. As of June 30, 2012, the program team had identified and engaged approximately 35 multi-national enterprises (MNEs) in various levels of discussion with SDTC portfolio companies whose technologies are considered mature or maturing and market ready.

Additionally, the Foundation has entered into memoranda of understanding (MOUs) with numerous provincial governments and select Canadian corporations. These partnerships allow SDTC to share some of its best practices on funding and supporting commercialization of clean technologies, and establish a dialogue on cleantech trends and opportunities. Further synergies are achieved by discussing and aligning with Provincial counterparts on individual technology projects that have been co-funded by SDTC and the respective Provincial organization. Since 2003, SDTC collaboration with provincial funding organizations has led to 69 SDTC-funded projects receiving \$132 million in additional funding (which constitutes part of the \$1.6 billion in leveraged funding). MOUs with corporations, a more recent undertaking, have already led to \$37 million in investment into SDTC companies to date.

#### Planned Actions 2012/13

SDTC will continue the creation of go-to-market consortia in all of its primary activities by providing value-added services that connect individual portfolio firms to new market channels and end users thereby increasing the likelihood of successful market entry.

## 3.5 Broker Non-Portfolio Projects

**Objective:** Broker relationships that accelerate the dissemination of sustainable development technologies toward the marketplace.

In some cases, technologies that apply for funding from the Foundation do not meet the funding criteria and are, therefore, deemed ineligible for SDTC funding. These technologies, however, may still have a role to play in the development of a sustainable technology infrastructure in Canada. In cases where a project has a beneficial impact but does not directly fit SDTC's funding criteria, SDTC will broker relationships that will accelerate the dissemination of that project and its associated technology in the marketplace.

As part of its mandate, SDTC helps all applicants identify and highlight key areas of the value proposition relating to their proposed technology. This coaching helps the applicants structure their projects in the most effective and efficient manner possible, increasing the possibility that their technologies will be taken forward successfully. SDTC routinely redirects entrepreneurs who do not fit the SDTC funding criteria to funding sources that are appropriate to their circumstances and characteristics. As the portfolio has grown and relationships have developed, this has become a regular occurrence.

It is difficult to track and quantify the results of SDTC introductions of non-portfolio projects to companies in the private sector. SDTC will continue this activity as a regular practice; however, SDTC does not have the staff or resources to monitor or report on non-portfolio opportunities that have been enabled.

#### Planned Actions 2012/13

SDTC will continue to routinely redirect entrepreneurs who do not fit the SDTC funding criteria to funding sources that are appropriate to their circumstances and characteristics, such as Industry Canada's Industrial Research Assistance Program (IRAP), the Program of Energy Research and Development (PERD), National Sciences and Engineering Research Council (NSERC), and the National Research Council (NRC).

### 3.6 Identify Solutions to Adoption Barriers

**Objective:** Report and communicate to stakeholders and partners, including identification and advocacy around market barriers, energy policy, capital availability, product codes and standards and regulations.

The diffusion and demonstration of innovative technologies face a number of barriers: economic, technological, and regulatory, amongst others. SDTC works with numerous stakeholders to identify these barriers and ways to overcome them. SDTC works with numerous stakeholders to identify the barriers to adoption of certain sustainable technologies as well as ways to overcome those barriers.

In 2011/12, SDTC engaged with technology adopters, particularly those with integrative capabilities, to overcome barriers by providing policy and regulatory support and technology procurement. The Foundation also worked with industry associations and stakeholders to identify and overcome barriers to adoption of clean technologies.

SDTC will continue working with strategic MNEs, industry associations and other stakeholders to identify and overcome barriers through the Technology Adoption Partnership program to identify and overcome barriers to the adoption of clean technologies and access new international markets.

#### Planned Actions 2012/13

As technology areas are assessed by SDTC, barriers to market entry for clean technologies will be identified and communicated nationally through a number of channels, including the Foundation's website, various workshops and direct discussions with key stakeholders and government decision-makers. A longer-term goal is to provide insights and knowledge support to policy makers on regulatory changes that increase market penetration of sustainable development technologies.

## 3.7 Workshops and Outreach

**Objective:** Increase capacity within the targeted economic sectors for accessing project funding and improving their management capacity.

The Foundation conducts a number of workshops and other outreach initiatives that are intended to build the capacity of technology developers to communicate the value of their initiatives and to obtain support from the public and private sectors. In 2011/12, SDTC hosted workshops and participated in a number of cleantech-related conferences. SDTC management and staff accepted invitations to speak at 21 events between July 1, 2011 and June 30, 2012, including significant global events such as the Globe 2012 and Singapore International Water Week.

The Foundation held monthly meetings to discuss cleantech developments in Canada with a number of government agencies. In addition, SDTC held approximately 75 meetings with ministers, deputy ministers and other senior government officials to increase their awareness of the cleantech sector in Canada and the results of SDTC initiatives. SDTC participated in several broad national policy-related initiatives, including the development of DFAIT's Cleantech Strategy and discussions regarding the availability of new technologies to enable upcoming regulations being developed by Environment Canada.

#### Planned Actions 2012/13

SDTC will continue capacity building and outreach through workshops and webinars, including funding application workshops, participation in a number of cleantech-related conferences and other opportunities. These will be aimed at a wide variety of stakeholders, including potential applicants, investors, government representatives and other interested parties.

### 3.8 Communications

Objective: Educate, raise awareness and promote benefits of sustainable development technologies.

The Foundation undertakes a number of communications initiatives that are intended to disseminate related information, provide education, and raise awareness of sustainable development technologies in Canada. Over the past year, SDTC led eleven events with federal ministers and other senior members of provincial and federal governments. The Foundation appeared before the newly-formed Parliamentary Cleantech Caucus to provide members of Parliament with an overview of cleantech in Canada.

In the summer of 2010, in response to interest expressed by several members of Parliament, SDTC initiated a program focused on building increased awareness by parliamentarians of SDTC portfolio companies. To date, 19 MP visits have been conducted at SDTC portfolio companies. The effort has been invaluable in demonstrating to the participating MPs the real success of cleantech in Canada and the role that the Government of Canada, through SDTC, is playing in driving the cleantech sector.

As required under the Funding Agreement, the Foundation released the *SDTC 2011 Annual Report*, the 2011 *SDTC Annual Report Supplement*, and the *SDTC 2012 Corporate Plan*, all of which were produced and tabled in the House of Commons and Senate, and subsequently circulated among various levels of government, industry and the not-for-profit sector.

Between July 1, 2011 and June 30, 2012, articles mentioning SDTC appeared in 2682 publications, including newspapers, magazines, websites and blogs. These articles were spread across 22 different countries, with the majority appearing in Canada, the United States and Europe.

#### Planned Actions 2012/13

Using media, functions and events, SDTC will strategically evaluate prospects to reach target audiences. Opportunities to be pursued include:

- Funding announcements that provide the Ministers of Natural Resources Canada and Environment Canada and other elected representatives an opportunity to profile the Government of Canada's contributions with respect to key policy areas;
- Continued development of SDTC portfolio company success stories;

- Media relations campaigns that will generate national or regional media coverage for SDTC portfolio projects;
- Participation in conferences and other events; and,
- Increased use of social media to raise awareness of SDTC and the benefits of adopting clean technologies.

Other primary communications tools that will be employed include the SDTC website, brochures, ministerial briefings, press kits, and the Foundation's annual report/annual report supplement.

## 3.9 Business Case for Sustainable Development

**Objective:** Build the business case for sustainable development technologies and drive a national strategy for sustainable development.

SDTC periodically reviews the needs of Canadian economic sectors and utilizes its SD Business Case methodology to assist in determining priorities. With the global reduction in defense spending, and a call for clean energy technologies, SDTC has identified the Aerospace, Defense, and Security (ADS) sector as the next sector in transition. As such, preliminary analysis indicates that a modified, and largely ADS self-funded SD Business Case may be appropriate.

#### Planned Actions 2012/13

SDTC will continue to engage major aerospace and defense prime contractors in developing a business case to adopt SDTC-supported technologies into their supply chain as they transition to serve commercial energy and environmental markets. As this initiative aims to seek cost-sharing and therefore has a sequenced contributor approach, the timelines will be extended compared to previous SD Business Cases.

## 4. NextGen Biofuels Fund

The NextGen Biofuels Fund (NGBF), created in September 2007, is aimed at supporting the establishment of firstof-kind large demonstration-scale facilities for the production of next-generation renewable fuels and co-products in Canada. The NGBF is intended to encourage the development of technology expertise and innovation capacity for the production of next-generation renewable fuels in Canada. It will help improve sustainable development impacts that arise from the production and use of renewable fuels in Canada and internationally and will help Canada sustainably meet potential future expansions of its renewable fuels standard (RFS).<sup>21</sup>

In addition to supporting the RFS, the NGBF is aligned on a number of other federal and provincial initiatives, such as forestry and agricultural programs, clean energy initiatives, and climate change efforts. Further, next-generation biofuels offer potential benefits to numerous sectors. For instance, the use of woody biomass for biofuels may create new opportunities for the forestry sector, while conversion of agricultural waste to next generation renewable fuels can create new revenue streams for the agriculture sector. Next generation biofuels derived from biomass include cellulosic ethanol, Fischer Tropsch liquids such as drop-in diesel and jet fuel, algae based synthetic fuels, and pyrolysis oil and its drop-in fuels derivatives. In addition, most next-generation biofuels projects include co-products such as bio-energy and biochemicals, therefore stimulating the development of a wide ranging bioeconomy in Canada.

The NGBF is positioned downstream in the innovation chain from the SD Tech Fund. While designed to complement the SD Tech Fund, the NGBF is different in several important ways. For instance, whereas the SD Tech Fund provides funding to pre-commercial demonstration projects and has a scheduled call for funding process, the NGBF is a project financing vehicle for first-of-kind, commercial scale demonstration facilities, and has continuous intake of Applications for Funding (AFFs), a gated funding approval process, and repayment terms based on free cash flow over a period of

<sup>21.</sup> The *Renewable Fuels Regulations*, published on September 1, 2010 require an average renewable fuel content of five per cent in gasoline starting December 15, 2010. The Regulations already include full provisions to require fuel producers and importers of diesel fuel and heating distillate oil to have an average annual renewable fuel content equal to at least 2% of the volume of distillates that they produce and import: http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-189/index.html

ten years from project commissioning. The first call for applications was made in the third quarter of 2007, and subsequent calls were made in the third quarter of 2008, the second quarter of 2009, the second quarter of 2010, and the third quarter of 2011.

The NGBF investment plan is driven by the following requirements in the NGBF Funding Agreement with the Government of Canada:

- Demonstrate techno-economic feasibility of first-of-kind large demonstration-scale facilities;
- Reduce financial costs of producing renewable fuels;
- Expand renewable fuels production and improve sustainable development impacts;
- Encourage retention and growth of technology expertise and innovation capacity;
- Achieve environmental, social and economic benefits.

The NGBF investment plan is also driven by complementary NGBF requirements such as:

- Considering Canadian diversity and early stage of industry, aim at pathway, fuel and feedstock diversification;
- Seeking top world performance, bring foreign technology leaders to Canada for direct investment;
- Recognizing capital intensity of industry, secure strong partners, learn through front-end project development and allocate capital in order to support a range of opportunities.

In order to implement its investment plan, the NGBF conducted a systematic industry analysis leading to the tracking of approximately 200 next generation biofuel companies worldwide which are developing next generation biofuels technologies for commercial deployment. The 200 company data base has been filtered against the following criteria in order to obtain a shortlist of less than 50 preferred NGBF target companies:

- Next generation renewable fuel by NGBF definition;
- Non agricultural food feedstock with preference to waste feedstock;
- Novel pathway at pre-commercial demonstration stage;
- Novel pathway with better GHG performance than fossil fuels and first generation biofuels and, applicable in Canada.

The companies included in the NGBF shortlist have been classified by technology pathways defined and benchmarked according to key performance metrics by the National Renewable Energy Laboratory of the U.S. Department of Energy ("NREL") and according to the NGBF Business Case (2009).

As of June 30, 2012, the NGBF has received eight AFFs, five of which are still active and part of the aforementioned NGBF investment priority shortlist and three of which have been withdrawn. Of those five active AFFs, three have been approved for front-end development funding according to the NGBF Project Assurance Process (PAP), one AFF is under due diligence, and one is being updated after being considered incomplete. Four indications of interest (IOIs) from companies that are still working to meet eligibility conditions have been received and four new AFFs are expected in the short term. The AFFs cover a wide array of feedstock and process pathways for the production of next generation renewable fuels across Canada. Applicants include leading technology companies from the next generation biofuels industry as well as strategic partners from the energy and forestry sectors. These originate in Canada, the United States and Europe. Funding requests pertaining to the AFFs received to date and to those expected in the short term exceed the NGBF availability. It is therefore expected that the fund will be deployed as per the requirements of the NGBF Funding Agreement with the Government of Canada.

## 4.1 Next Gen Renewable Fuels Industry: Update and Challenges

SDTC has recognized that the production pathways for next-generation renewable fuels and co-products are not yet technologically viable or economically competitive at large demonstration scale. Further, current difficulties faced by renewable fuels technology developers in accessing sufficient private sector capital for demonstrations at large scale have inhibited the implementation of such projects. The following key points summarize the current state of the next-generation renewable fuels industry.

- The quest for energy independence in the United States remains a strong driver for the development of the biofuels industry. Indeed, according to the 2012 Annual Energy Outlook of the US Energy Information Administration, while the energy production picture in the United States is much brighter than it was a few years ago, the US is still forecast to be a significant importer of crude oil for the next 25 years. The increase in domestic crude oil production, renewable fuels, the use of natural gas for transportation, and improved fuel economy will see US crude oil imports drop from 48% of liquid fuel requirements in 2009 (9 million bbls/day) to less than 37% in 2035. Meanwhile, biofuels are currently supplying about 1 million bbls/day in the US and such amount is expected to increase to over 2 million bbls/day in 2035. While due to budget constraints, opponents challenge the country's renewable fuels policies, the U.S. mandate for cellulosic biofuels still calls for the construction of approximately 200 bio-refineries at an estimated capital cost of \$100 billion. Near term volume targets for cellulosic biofuels have however been reduced due to shortage of supply, and operating incentives are phased out for budget considerations.
- In Canada, the RFS requires additional ethanol capacity amounting to 1 billion litres per year before 2034. Availability of residue-based biomass amounts to 85 million tonnes per year in Canada, which is equivalent to approximately 20-times the projected Canadian ethanol capacity increment by 2034. Production of next generation biofuels in Canada will support both the Canadian and U.S. requirements in light of the respective renewable fuels mandates, thus generating social, environmental and economic benefits.
- Better harmonization of Canadian and U.S. renewable fuels policies would benefit industry developments in Canada. It is worth mentioning, however, that North American renewable fuels programs are considered at the forefront on the global scene.
- The International Energy Agency's *Technology Roadmap Biofuels for Transport*,<sup>22</sup> released in April 2011, forecasts that in 2050 renewable fuels will represent 27 per cent of global transportation fuels consumption, have a total production value of approximately \$12 trillion and reduce CO2 emissions by 2,100 megatonnes per year.
- Commercial projects are moving forward in the US namely by Ineos, Abengoa, POET, Mascoma and Kior. As industry leaders progress towards commercialization following pre-commercial demonstrations, strategic partners pick the winners and some industry rationalization is already occurring. In the meantime, the NGBF identifies at least nine commercial projects under development in Canada which have either applied or indicated interest for NGBF funding.
- While some IPO events and opportunities are noted, first-of-kind risk and tight credit markets require that the next generation renewable fuels and biochemicals industry relies on strategic investors and government financing for initial commercial roll-out.
- Renewable fuels sustainability is a controversial issue and the analysis framework to ensure sustainability is still being defined. Sustainable commercial projects are identified for the production of both the first generation and the second generation of biofuels and biochemicals.
- SDTC has observed increased NGBF deal flow activity from 2010 to 2012. This is attributable to the easing of the financial crisis and to progress achieved on the technology development front.
- New opportunities are arising to reduce challenges in realizing the potential of next-generation renewable fuels, such as the conversion of well situated forest industry sites to biofuels production.

<sup>22.</sup> International Energy Agency (IEA) (2011) Technology Roadmap: Biofuels for transport http://www.iea.org/papers/2011/biofuels\_roadmap.pdf (accessed September 2011)

## 4.2 Canadian Opportunity for Next-Generation Renewable Fuels

The emergence of next-generation biofuels will be enhanced by the Canadian RFS regulation and will, in turn, facilitate compliance with that regulation. The RFS, which is at the basis of the Canadian opportunity for renewable fuels, has the following objectives:

- Encourage greater production of biofuels through market creation;
- Require five percent renewable content in gasoline beginning in 2010 and two percent renewable content in diesel fuels in Canada commencing in 2011;
- Reduce GHG emissions resulting from fuel use;
- Create sources of clean energy;
- Accelerate the commercialization of new biofuels technologies; and,
- Provide new market opportunities for forestry companies, agricultural producers and rural communities.

Because Canada is a net energy exporter, energy independence is not the main driver for renewable fuels; however, the federal government has an objective of making Canada a clean energy superpower. Next-generation biofuels have an important role to play in this objective, not just in the direct application in transportation fuels, but also by reducing the lifecycle GHG emissions associated with the extraction and refinement of hydro-carbon resources, particularly oil sands bitumen. This has important consequences for the capacity of the Canadian oil and gas industry to access key markets, particularly the United States.

Next-generation biofuels and co-products have the potential to create revitalization and diversification of the important forestry, agricultural, and natural resources sectors. An estimated 85 million tonnes per year of waste biomass (46 percent of which is forestry based) are available in Canada. This quantity of feedstock could potentially produce about 20 billion litres of gasoline equivalent fuels. This is almost an order of magnitude higher than current RFS program requirements. This creates a real opportunity for new revenue sources for the forestry and agriculture sectors.

Canada is currently a net ethanol importer. Consequently, there is an opportunity for incremental Canadian production to meet domestic demand. A strong domestic market would create strong demand for domestically produced feed stocks, such as forestry waste and agricultural waste. Further, the energy independence policy articulated in the US EPA Renewable Fuel Standard (RFS2) is the foundation of the world's largest regulated demand for next-generation renewable fuels.<sup>23</sup> As a major export partner of the United States, Canada is well positioned to benefit from this opportunity.

### 4.3 NGBF Outreach

To raise awareness about the NGBF and issues of importance to the emerging next-generation biofuels industry, SDTC conducts ongoing outreach initiatives. These include directly contacting targeted companies, presenting at specialized industry conferences, organizing and participating in industry workshops, calls for funding applications, and contributions to industry-related publications. These outreach activities are intended to increase NGBF visibility in North American and Western European markets.

US Environmental Protection Agency (2011) "Renewable Fuel Standard" http://www.epa.gov/otaq/fuels/renewablefuels/index.htmSEF Alliance (2009) "Why Clean Energy Public Investment Makes Economic Sense: the Evidence Base" http://www.sdtc.ca/uploads/documents/en/UNEP%20SEF%20Alliance%20Report.pdf, p 12.

## 4.4 NGBF Activities and Results 2011/12

In line with the NGBF objective to conduct systematic outreach activities, SDTC participated in four North American conferences between July 1, 2011, and June 30, 2012. Those events allow for direct contact with industry leaders and maintenance of the NGBF knowledge base. Meetings were held with provincial government and industry representatives across Canada to promote the NGBF and identify project opportunities.

Over the same period, the NGBF received two IOIs, two updatedAFFs and two new AFFs, one of which came from a company that had previously received SDTC funding. Due diligence was completed on three projects prior to securing approval from the NGBF Project Finance Committee, the Project Review Committee and the SDTC Board Directors for funding of project front-end development according to the NGBF Project Assurance Process. One Preliminary Contribution Agreement (PCA) was signed over the same period and two PCAs were under negotiation at the end of the period. As of June 30th 2012, one project was scheduled for eligibility review and due diligence while four AFFs were expected in the short term. One AFF remained incomplete and was under revision by the applicant. Two applications were withdrawn over the period. The current NGBF deal flow covers most next-generation renewable fuels processes and includes a variety of feedstock. The contemplated projects are at sites located across Canada.

The process leading to the completion of the NGBF Interim Evaluation was launched as per the Funding Agreement requirements. A study on the current status of the NGBF business environment was initiated in preparation for conversations with the main NGBF stakeholders.

Over the past year, NGBF conducted quarterly meetings with representatives of NRCan, Environment Canada and Agriculture Canada in relation to the NGBF Funding Agreement and the coordination of Canadian biomass/biofuels programs. The NGBF also acted to maintain close coordination with the SDTC Tech Fund with the intent of identifying candidates who could benefit from NGBF funding.

## 4.5 NGBF Planned Actions 2012/13

The main NGBF objectives for the period from July 1, 2012 through June 30, 2013 can be summarized as follows:

- Progress towards final investment decision on three projects in 2013.
- Make four funding decisions pertaining to front-end project development and sign four preliminary funding agreements.
- Secure four new AFFs and five new IOIs with a view to increasing the certainty of NGBF deployment by March 2017 as per Funding Agreement requirements.
- Finalize the study on the NGBF business environment and hold strategic conversations with key NGBF stakeholders.
- Complete the NGBF Interim Evaluation as per NGB Funding Agreement.
- Conduct outreach activities at key conferences and through direct contacts with leading companies and key government and industry stakeholders.

## 5. Financial Plan

## 5.1. Financial Plan — SD Tech Fund

This Plan, as approved by the SDTC Board of Directors, assumes that SDTC will continue to select companies for funding approval in 2012 and have capacity to work with a large contingent of companies with planned projects. The SD Tech Fund, and hence SDTC, is in wind-down mode in 2014 without an injection of Government funds in Budget 2013. SDTC continues to operate to distribute the funds in an effective and efficient manner, fulfilling the mandate it has been given.

In 2011, SDTC reduced the future overall life cycle operating expenses by 13 percent to ensure its approach is fully aligned with the Government of Canada's important deficit reduction initiative. This reduction has caused an accelerated wind-down of SDTC.

### 5.1.1. Financial Assumptions

The following assumptions have been used in establishing SDTC's operating budget and disbursement plans.

- This plan is predicated on a declining balance fund. This plan, reflects the extension of the fund disbursement end date to June 30, 2017 as defined in Funding Agreement Four, and revisions to other relevant Funding Agreement dates.
- With the announcement of an additional \$40 million allocated to SDTC in Canada's 2011 federal budget, a commitment has been made by SDTC management and the Board of Directors to invest \$610 million over the life of the fund. This amount includes interest income derived from funds that have been invested prior to being drawn upon for disbursements to projects already approved.
- The SD Tech Fund will be fully allocated by November 2012 based on an estimated \$45 million per funding round, and has a planned disbursement forecast of \$107 million in 2013.
- The current plan anticipates that the workload, driven by the number of applications and complexity of technology opportunities, will continue to grow over the next few years. Operating budgets will peak in 2013. This high activity is the result of continued screening of new applications while managing a peak in the number of projects undergoing contracting and execution.
- There are still a significant number of companies graduating from the SDTC portfolio, which entails a considerable amount of work in assisting portfolio companies in obtaining follow-on financing, as well as seeking out potential technology adopters and providing assistance in creating partnerships. These efforts are critical to enabling market entry by SDTC portfolio companies where the economic and environmental returns are realized.
- SDTC will continue to leverage its present funding contributions by two to three times. The plan is to allocate funding twice annually to new projects until November, 2012, with further allocations subject to recapitalization.
- The second interim evaluation found that the two-year period between the allocation target date and the disbursement target date was too short for the types of projects being undertaken and concluded that *"the Funding Agreement should be revisited to establish a disbursement target date that is more in keeping with the nature of the projects that have emerged from Canada's technology development community."* Accordingly, the disbursement target date has been amended and Funding Agreement Four provides for project disbursements to continue to June 30, 2017.

- The grant investment portfolio will be managed to meet the liquidity obligations of the project disbursements and operating costs.
- Expenditures include the maintenance, support and required enhancements to the Foundation's information technology, online application, and reporting systems. Information systems will continue to be enhanced to address CRM needs and for more efficient information flows to applicants and stakeholders. As more and more portfolio companies require assistance with follow-on financing and technology adoption activities, it is important to be able to track data for each company and to provide a platform to share information in an efficient and secure manner. Also, data is housed more effectively in the proprietary SDTC database which has been used to assist Government departments with various initiatives.
- Expenditures include work to enhance a results reporting methodology relating to both environmental benefits quantification and market transformation throughout 2017.
- SDTC's lifecycle budget is calculated based on the requirement that all annual and otherwise scheduled deliverables required under Funding Agreement Four need to be prepared and delivered throughout the lifetime of the fund. This includes the corporate plan, annual report, annual report supplement, annual meeting, Members meetings, post-contract reports and evaluations, and corporate performance and value-for-money audits, as well as requirements brought about by the Federal Accountability Act.

### 5.1.2. Project Allocation and Disbursements 2013 and 2014

Securities termination dates will continue to be matched as closely as possible to project funding requirements. Based on the additional allocation received in Canada's 2011 federal budget, plus the interest income that is expected to be generated over the life of the fund, SDTC is able to allocate an additional \$60 million (approximately) to new projects in 2012.

Annual project disbursement payments are projected to be \$90 million in 2012, between \$95 million and \$115 in 2013, and between \$80 million and \$100 million in 2014. For the period of January 1 to August 31, 2012, SDTC's project disbursements totaled \$32 million, bringing total disbursements to \$345 million. By the end of 2012, total disbursements are projected to be between \$380 million and \$390 million.

## 5.1.3. Operating Expense Budget and 2014 Preliminary Expense Budget

Operating Expenses (1000s)	2013 Planned Budget	2014 Pr	eliminary Budget
Governance	\$ 900	\$	1,000
Mandatory Reporting	1,400		1,200
Project Screening and Evaluations	2,200		1,700
Project Contracting and Monitoring	1,900		1,600
Infrastructure Development and Outreach	2,100		1,350
Financial Audit	50		50
General Administration	1,750		1,700
Outsourced Services	400		300
Investment Fund Management Fees	200		100
Technical and Financial Audit Costs	400		300
Other	300		200
Total Operating Expenses	\$ 11,200	\$	9,100

#### Asset Allocation Ratings Breakdown – July 2012 Sum of Market Value (1,000,000s)

Rating	Governr	nent	Other		Totals	
AAA	\$	128	\$	-	\$	128
AA		30		50		80
A		5		21		26
Money Market Securities		11				11
Total	\$	174	\$	71	\$	245

#### % Breakdown

Rating	Current %	Maximum	Available %	
Government AAA	52.1%	No Limit	No Limit	
Government AA	12.6%	No Limit	No Limit	
Government A	2.0%	No Limit	No Limit	
Other AAA	0%	80%	80.0%	
Other AA	20.5%	70%	49.5%	
Other A	8.4%	20%	11.6%	
Money Market Securities	4.4%	No Limit	No Limit	
Totals	100.0%			

#### Figure 12 - Grant Investment Portfolio



## 5.1.4. Investment Portfolio Status

SDTC continues to closely manage its \$245 million investment portfolio (as of July 31, 2012) placed with RBC Dominion Securities and TD Asset Management. The initial investment strategy remains current; that is, to match the cash flow resulting from interest income and investment maturities as closely as possible to the anticipated future financial requirements of the Foundation.

As of July 31, 2012, the RBC investment account had a market value of \$136 million, while the TD account had a market value of \$109 million. The investment portfolios are invested in accordance with the provisions of Funding Agreement Four as detailed in the preceding table (as of July 31, 2012).

## 5.2. Financial Plan — NextGen Biofuels Fund

### 5.2.1. Financial Assumptions

The NGBF has been determined by the Government of Canada to be a \$500 million declining balance fund with an element of repayability that is anticipated to occur between the latter stages of the disbursement period, which ends in 2017, and the end of the fund's life in 2027.

As at June 30, 2012 based on the AFFs currently on hand, three projects have received conditional allocation for disbursement before the end of March 2017, which is the end of the disbursement period as per the Next Generation Biofuel Funding Agreement. Since those projects are still at an early stage of their development and are subject to uncertainty regarding their implementation, it is expected that any project that is aborted during the NGBF project assurance process would be replaced by a new project from the NGBF deal flow.

It can be seen, when comparing the funding agreements for the SD Tech Fund and the NGBF, that there are areas of commonality, such as annual report obligations, audit and financial statement requirements and media announcements. However, the NGBF's primary activity of funding first-of-kind large demonstration-scale facilities is significantly different and, therefore, requires additional and distinct work to be undertaken. Therefore, the budget and financial statements are presented and tracked as individual funds. The NGBF has its own expenditures with different assumptions to be tracked and updated accordingly.

Operating Expenses (1000s)	2013 B	udget	20	14 Preliminary Budge	et
Governance	\$	225	\$	250	
Mandatory Reporting		325		350	
Project Screening and Evaluations		1,300		1,000	
Project Contracting and Monitoring		600		1,000	
Infrastructure Development and Outreach		200		200	
Financial Audit		20		20	
General Administration		200		350	
Outsourced Services		100		200	
Other		30		30	
Total Operating Expenses	\$	3,000	\$	3,400	

## 5.2.2. Operating Expense Budget and 2014 Preliminary Expense Budget

### 5.2.3. Investment Portfolio Status

SDTC continues to closely manage the current \$58 million investment portfolio (as of July 31, 2012), which is placed with RBC Dominion Securities and TD Asset Management. The initial investment strategy remains current; that is, to match the cash flow resulting from interest income and investment maturities as closely as possible to the anticipated future financial requirements of the NGBF.

As of July 31, 2012, the RBC investment account had a market value of \$26 million, while the TD account had a market value of \$32 million. The investment portfolios are invested in accordance with the provisions of Funding Agreement Four, as detailed in the following table.

## NGBF Asset Allocation Ratings Breakdown — July 31, 2012 Sum of Market Value (1,000,000s)

Rating	Government		Other		Totals	
AAA	\$	19.2	\$	-	\$	19.0
AA		0.6		25.2	\$	25.8
A		-		-		-
Money Market Securities		13.2		-		13.0
Total	\$	33.0	\$	25.2	\$	58.2

#### % Breakdown

Rating	Current %	Maximum	Available %
Other A	0%	20%	20.0%
Other AA	43.4%	70%	26.6%
Other AAA	0%	80%	80.0%
Government AA	1.0%	No Limit	No Limit
Government AAA	33.0%	No Limit	No Limit
Money Market Securities	22.7%	No Limit	No Limit
Totals	100.0%		

### Figure 13 - Grant Investment Portfolio



Rating	Current %	Maximum	Available %
1. Government AAA	33.0%	No Limit	No Limit
2. Government AA	1.0%	No Limit	No Limit
3. Other AAA	0%	80.0%	<b>80</b> %
4. Other AA	43.4%	70.0%	26.6%
5. Other A	0.0%	20.0%	20.0%
6. Money market securities	22.7%	No Limit	No Limit

## 6. **Risks and Mitigation**

As part of its corporate risk management strategy, SDTC regularly identifies, assesses and monitors existing and emerging business and organizational risks. This section highlights key emerging risks and identifies the mitigation measures SDTC is putting in place to address them.

## 6.1. SD Tech Fund

## 6.1.1 Results and Economic Risks to Canada

The issue: The wind-down plan for the SD Tech Fund merely allows basic management of the current funds and project disbursement obligations. The significantly reduced budget does not contain sufficient resources to maximize commercialization success and enable the sunk cost of public investment to derive the significant returns that have been thoroughly demonstrated by SDTC's performance to date. Furthermore, this would occur at a critical point in time as clean energy markets expand globally, and Canadian exports are presently well-positioned to take their share.

While there is a range of expertise across government in the area of energy, the SDTC team has proven itself to be unique in its ability to efficiently deliver economically viable companies. This hybrid of private sector people providing demonstrable value from public sector funding is unprecedented across Government.

This uncertainty will likely inhibit third-party investors from providing crucial financing to existing projects and set back Canada's entire cleantech/clean energy community thereby posing a considerable risk to the ability of the Foundation to fulfill its mandate. There is a very wide group of industry players in all sectors of Canada's economy—large corporations, SMEs, and the investment community—that will be detrimentally impacted by a wind-down of SDTC.

### Mitigation: New Funding for a New Model

SDTC will continue efforts to secure recapitalization, however, SDTC has proposed a new funding model which incorporates a number of instruments and mechanisms discussed over the past several years, including a warrants component to obtain partial repayment and inclusion of strategic partners who themselves may directly donate funds to SDTC—all of which is intended to lower the government's overall financial outlay to maintain SDTC's momentum.

## 6.1.2 Canadian Business Productivity and Competitiveness Risk

**The issue:** The United States, China, South Korea, and Europe are all investing heavily in clean technologies. Canada risks losing its competitive edge, as clean technologies delivers efficiency, cost savings, and higher performance all key elements to maintaining market leadership. International resources are based on trust and long-term relationships that that SDTC has earned and will not be rapidly replaced.

**Mitigation:** SDTC has implemented various commercialization Memoranda of Understanding (MoU), including a comprehensive one with Export Development Canada and with the United Arab Emirates, to enable Canadian portfolio companies access to global markets. These MoUs provide market instruments and channels that Canadian cleantech companies would not otherwise have. Additionally, SDTC works closely with DFAIT to address global markets as well as guidance and provision of portfolio companies for missions.

## 6.1.3 Economic and Market Uncertainty Risk – Now Reduced Substantially

The issue: Since the market crash of September 2008, clean technology developers have encountered even greater challenges in obtaining pre-commercialization financing. While the economy appeared to have stabilized in 2010 and early 2011, uncertainty has re-emerged in the spring and summer of 2012, that some observers believe may be long term. This has been exemplified, and exacerbated by, the recent instability amongst major economies in Europe and the US. In Canada, however, SDTC's Follow-on Financing results have shown a steady recovery from the 2009 market downturn and this upward momentum has not waivered since. The Foundation has been successful in funding 238 projects (for a total of \$581 million of SDTC funding and \$2.1 billion in project value). Additionally, 63 projects have been completed, of which 33 percent have been commercialized. The economic downturn risk, therefore, is considered to have diminished.

**Mitigation:** SDTC intends to maintain the positive market momentum of its companies by building ever-stronger and broader relationships with the investment community, particularly through its initiatives to attract capital to projects, such as the Follow-on financing program and the Technology Adoption Partnership program, with its focus on strategic (long-term) large multi-national technology adopters.

This includes hosting stakeholder sessions with a range of participants, including strategic multinational companies and investors, to ensure that the projects that SDTC approves for funding are in alignment with the needs of those communities. Outreach activities, such as the SDTC/TMX Investor Days and presentations at targeted conferences will continue to facilitate the introduction of portfolio companies to potential investors.

## 6.1.4 Regulatory and Policy Risk – Now Reduced Significantly

The issue: In their early, pre-commercial phases, clean technologies often require regulation or other policy support to provide incentives or mandates that will encourage the market to adopt the technology. This Government has been issuing strong regulations primarily through Environment Canada, especially in the areas of SDTC focus such as Transportation. Therefore, SDTC sees synergy between its results and the Government's policy intent. As such, this risk is significantly reduced.

## 6.1.5 Evaluation Risk

The Issue: SDTC is a federally funded foundation that operates under a complex framework of legislative, contractual, and policy requirements. SDTC is responsible for disbursing \$1.09 billion in grants in support of sustainable development technologies. Managing public money means that SDTC will be closely scrutinized through various accountability mechanisms. More specifically, it is required to operate in compliance with its Act, the funding agreements, the Federal Accountability Act, all other referenced Acts and regulations, and relevant federal government policy and direction.

SDTC has an extensive Evaluation Logic Model with key performance indicators and results that deliver value to business and industry. This evidence has been collected, reviewed, and presented during numerous audits and evaluations for which SDTC has consistently exceeded the benchmark.

While it is understood that agendas will evolve over time, SDTC is in the business of accepting and managing risk so as to commercialize innovation and transform the market. The underlying value is to diversify and strengthen the Canadian economy and drive greater export revenue while all the time improving the environmental performance of Canadian industry. By definition, this is a strategy that shows greater return over the longer term. Importantly, SDTC has already delivered significant results earlier than anticipated. These results, delivered and validated from third-party sources, have underlably added value to Canada which has been reinforced in these audits and evaluations.

It is important, therefore, to define and stick with the performance criteria established for the Foundation. Many of the various audits have added little benefit, and they take significant time and resources of the Foundation. As such, from a costbenefit point of view, they have incurred direct and opportunity costs. SDTC is transparent and accountable, and as an entity discrete from the Government, it is easier to track and determine this. SDTC supports the need for evaluations, just not as many. In addition to the evaluations specified in the Funding Agreement for the SD Tech fund, an NRCan "Value for Money" audit was conducted in 2010/11 and again showed SDTC to meet or exceed all requirements. SDTC is the only arms-length foundation upon which the Office of the Auditor General has completed an audit, and again, SDTC performed well. SDTC was one of a handful of non-Industry Canada programs incorporated in the Review of Federal Support for Research and Development (the Jenkins Report) where it was noted in the report and the Panel as an exemplary organization for commercializing innovation.

An NGBF initial evaluation is presently underway. A new assessment of SDTC is also taking place.

**Mitigation:** SDTC has an independent, four-gate selection and funding process that ensures that projects are selected on merit (well informed by the private sector through SDTC's Investment Committee), approved by the Board, and that disbursements follow the required approval levels, with additional financial oversight provided by the Audit and Grant Investment Committee.

SDTC has assessed the requirements of the Funding Agreement and applicable legislation and has processes in place to monitor its adherence through regular management and Board briefings and meetings. It has qualified staff in place to manage key processes, formal management systems and processes, corrective action and continual improvement processes in place. SDTC is working proactively with the Government to ensure public interest is protected while recognizing the cost-benefit tradeoff in approach, depth, and frequency of the audits and evaluations.

### 6.1.6 Governance Risk

**The issue:** To keep the momentum created by the Foundation going and to empower SDTC to obtain even greater returns for public funds, there needs to be a change to its governance and funding frameworks. This could include the ability to co-invest with the private sector and take equity (in the form of warrants) attached to grants as a means of providing some repayment.

SDTC is faced with Board positions that remain unfilled causing significant burden on the current directors.

**Mitigation:** SDTC has formulated a comprehensive plan for a new fund with a new model—one which builds on SDTC's existing and proven governance structure while introducing new elements to improve effectiveness.

## 6.2 NextGen Biofuels Fund – Risks and Mitigation

### 6.2.1 Technology and Scale-up Risks

The issue: Technology and scale-up risks may impact the deployment of next generation biofuels, thus preventing Canada from obtaining the related sustainability, social and economic benefits.

**Mitigation:** The NGBF develops Canadian biofuels projects after selecting the most promising technologies through a thorough benchmarking process, once such technologies have been sufficiently demonstrated at pre-commercial stage. The NGBF invests into a diversified pool of technology pathways with the best available partners and follows a rigorous project assurance process.

### 6.2.2 Federal Biofuel Policy Risk

The issue: Financial constraints experienced by governments may unfavourably impact biofuels support policies before the industry has reached targeted performance.

**Mitigation:** Government programs for supporting capital investments such as the NGBF are in place while direct operating incentives are phasing out. Regulated and market driven support mechanisms are available at low cost to governments in order to bridge the initial performance gap of the next generation biofuels industry.

### 6.2.3 Economic Climate Risk

The issue: The challenging economic climate unfavourably impacts the next gen biofuels industry deployment.

**Mitigation:** The NGBF provides strategic project developers with financial comfort to help them absorb unfavourable economic cycles occurring during their long term deployment plans. The NGBF funds a significant share of both the front-end project development costs and the construction costs.

### 6.2.4 Regulatory Harmonization Risk

**The issue:** Unresolved issues pertaining to harmonization of Canada-US biofuels policies may prevent the expected implementations in Canada or cause distortion in policy administration.

**Mitigation:** The NGBF is collaborating with governments and biofuels companies for identifying and addressing critical policy harmonization/compatibility issues, such as definition of biomass for eligibility to renewable fuels standards and harmonization of operating incentives.

### 6.2.5 Natural Gas Risk

The issue: Newly discovered low cost fossil energy reserves in North America tend to take the focus away from next generation biofuels. This could reduce the pace of development pertaining to long term solutions which are required for sustainable energy supply.

**Mitigation:** The industry driver for biofuels in North America is the US Energy Independence and Security Act which represents a huge economic opportunity for Canada, as well as an opportunity to gain important sustainability benefits. Despite the availability of low cost natural gas and new oil reserves, US crude oil imports will still be at 37% of requirements in 2035, therefore calling for the availability of alternative fuels such as next generation biofuels.

The NGBF mission is to launch first-of-kind large scale next generation biofuels plants in the current decade in order to trigger the development of commercial supply for next generation biofuels in the 2020's and 2030's. Short term market situations should not impact the NGBF mission or interfere with the Government's stated long-term objectives.

## 6.2.6 Financing Risk

The issue: Because the NGBF is intended to provide high CAPEX financing for large-scale demonstration projects, applicants must have technologies that are sufficiently advanced to be ready for such an implementation. Globally, there are hundreds of companies involved in the development of processes for new biofuels and co-products. Many of these companies have promising technology but are still at the pilot plant stage or in the process of developing a demonstration plant. Only a few have successfully built and operated a sufficiently-sized demonstration plant and are reasonably in a position to move up to the construction of a full-scale plant.

These companies need more capital before they are in a position to qualify for NGBF funds. In the current economic climate, this is compounded by the limited equity financing available for such high CAPEX projects. While the NGBF was founded to offset the lack of available debt financing, insufficient equity financing creates an additional risk.

**Mitigation:** The NGBF team continues to actively search for firms with proven technologies, and to provide outreach and other support to secure equity financing. SDTC will continue to use the SD Tech Fund to advance technologies toward demonstration-scale plants that can be scaled up to first-of-kind demonstration-scale facilities.

NGBF works with oil companies, large equity firms, and other strategic investors to increase awareness of, and comfort with, this important catalytic fund for the agriculture and forestry sectors.

SDTC works closely with businesses and their industry associations to ensure relevance and policy considerations are aligned with NGBF. SDTC will continue its dialogue in order to raise awareness amongst policy makers about the need for policies that are conducive to the development and deployment of Canadian next-generation biofuels technologies and in the competitive global market.

SDTC developed a strategy to select the strongest developers that have the greatest chance of success. The fact that US and European developers are relocating to Canada and applying to the NGBF attests to the performance of the NGBF and the Canadian Government in this arena.

## 7. Governance and Team

## 7.1. Legal Business Description

The Foundation for Sustainable Development Technology Canada (SDTC) was established by an Act of Parliament and received Royal Assent in June 2001. SDTC is registered as a not-for-profit, non-share capital corporation governed by a 15-member Board of Directors and is subject to selected provisions of the Canada Business Corporations Act. A Member Council composed of individuals representing the interests of the public, private and academic sectors serves as a proxy for shareholders. The Foundation is not an agent of Her Majesty. However, SDTC is accountable to Parliament through the Minister of Natural Resources Canada. Environment Canada and Industry Canada are the other key departments involved in the work of the Foundation. The head office is in Ottawa, Canada.

## 7.2. Funding Agreement

"Original Agreement" refers to the Agreement executed March 26, 2001, for the purpose of establishing the Fund, setting forth the terms and conditions under which the Foundation agreed to administer, manage, invest and disburse the initial grant of \$100 million.

*"Funding Agreement Two"* rrefers to the Agreement signed by the Parties on March 31, 2004, which provided the additional grant of \$250 million allocated in Canada's 2003 federal budget and received in April 2004. Funding Agreement Two defined the obligations for the entire \$350 million grant.

*"Funding Agreement Three"* refers to the Agreement signed by the Parties on March 31, 2005. This Funding Agreement, which addressed the additional investment of \$200 million received in April 2005, defines the obligations for the entire \$550 million and expands SDTC's mandate to include technologies that address issues related to clean soil and clean water.

*"Funding Agreement Four"* refers to the Agreement signed by the Parties on August 9, 2012. This Funding Agreement, addressed an additional investment of \$40 million and defines the obligations for the entire \$590 million funding in the SD Tech Fund. It also altered some key parameters for project funding to enable greater results, such as expanding the timelines for projects from 5 years to 6 years.

"The Next Generation Biofuel Funding Agreement" refers to SDTC's fourth capitalization, and was signed on September 4, 2007. The agreement addresses \$500 million allocated in Canada's 2007 federal budget to be managed by SDTC for investment with the private sector in establishing large-scale facilities for the production of nextgeneration renewable fuels.

## 7.3. Directors

Sustainable Development Technology Canada is governed by a Board of Directors reflecting the broad interests of the public, private and academic sectors in Canada. It is composed of 15 members, seven of whom are appointed by the Government of Canada. The remaining eight are appointed by Members. There are five Board committees: the Corporate Governance Committee (CGC), the Human Resources Committee (HRC), the Project Review Committee –NextGen Biofuels Fund (PRC-N), and the Audit and Grant Investment Committee (AC). Committee appointments are as indicated below. Both the Chairman and the President and CEO serve on the Board committees as ex-officio, non-voting members.

Name	Title	<b>Board Committee</b>
Juergen Puetter	President, Chair and CEO, Aeolis Wind Power Corporation; President, Chair and CEO, Blue Fuel Energy Corp.; Chairman SDTC	Ex-officio on all Board committees
Ken Ogilvie	Independent Consultant; Vice-Chair, SDTC	CGC, HRC, PRC-N*
David Berthiaume	Executive Director, OLEOTEK Inc.	AC, PRC-N
Michael J. Brown	Chairman of the Board, Chrysalix Energy Management Inc.	PRC-S
Charles S. Coffey, O.C.	Community Volunteer	HRC*, CGC, AC
K. Ross Creelman	Managing Director, Marwood Ltd.	HRC, CGC
Judy Fairburn	Executive Vice President, Strategic Planning & Environment, Cenovus Energy Inc.	PRC-N
Dr. Jane E. Pagel	President & CEO, Ontario Clean Water Agency	PRC-S*
David Pollock	President of Pollock Management and Advisory Services and former Executive Director of the Pembina Institute	CGC*, HRC, PRC-S
Dr. Jacques Simoneau	President & CEO, Univalor	AC*, PRC-N

The following table lists Directors of the Board of SDTC as of June 30, 2012.

\*Committee Chair

## 7.4. Members

The Members of the Foundation consist of 15 industry leaders, all of whom are appointed/reappointed by the other Members in accordance with the *Act*. Their function is to provide an informed and representative perspective of sustainability and contribution toward the achievement of SDTC's mission and goals.

The following table lists the Members of SDTC as of June 30, 2012.

Name	Title
Carl Brothers, P.Eng.	President, Frontier Power Systems Inc.
James R. Burpee	President and CEO, Canadian Electricity Association
Dr. Peter Hackett, FCIC, FRCS	Executive Professor, School of Business, University of Alberta
D. Christine Hollstedt, RPF	Founding President and CEO, FORREX Forum for Research and Extension in Natural Resources
James Knight	President and CEO, Association of Canadian Community Colleges
Dr. Louis LaPierre	Professor Emeritus, Université de Moncton
David Runnalls	President and CEO, International Institute for Sustainable Development
Andrew T. B. Stuart	Chairman, Sustainability Shift Inc.
Katherine Trumper	Management and Communications Consultant, Katherine Trumper Consulting
Dr. Joseph D. Wright	Independent Consultant

## 7.5 Officers

The following table lists the officers of SDTC as of June 30, 2012.

Name	Title	
Juergen Puetter	Chairman of the Board	
Dr. Vicky J. Sharpe	President and CEO	
Ken Ogilvie	Vice-Chair of the Board	
Richard J. Whittaker	Vice President, Investments and Chief Technology Officer	

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## Sustainable Development Technology Canada

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