

Building on Success

Climate Change Action Fund (CCAF)

2002-2003 Annual Report

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Executive Summary

The Government of Canada established the Climate Change Action Fund (CCAF) in the 1998 federal budget, allocating \$150 million over three years to help develop a national implementation strategy and support early actions to respond to climate change. The second three-year phase was announced in Budget 2000, with a further \$150 million in funding.

Building on Success, The Climate Change Action Fund 2002-2003 Annual Report, is designed to provide information on results and activities for the fiscal year ending in March 2003. The CCAF operates on principles that include: building, where possible, on existing initiatives and mechanisms; leveraging and sharing costs with provinces/territories and the private sector; ensuring there are concrete milestones and demonstrable results; and, establishing transparent processes that engage all federal departments, as well as agencies and external stakeholders.

Notable among the CCAF accomplishments during the past fiscal year were the analytical and policy work and the national consultation process needed in order to make possible Canada's ratification of the Kyoto Protocol on December 17, 2002. Stakeholder workshops were held in 14 major cities across the country in June 2002 to elicit views on the *Discussion Paper on Canada's Contribution to Addressing Climate Change*. A web site where Canadians could provide comments and submissions on the discussion paper and the subsequent draft climate change plan was established. The *Climate Change Plan for Canada* was then developed along with a strategy for its implementation in November 2002.

The operation and management of the national process included two Joint Meetings of Ministers of Energy and Environment (JMM), ensuring jurisdictional engagement prior to Kyoto ratification. After the Protocol was ratified, focus shifted to bilateral Federal- Provincial-Territorial work including the development of Memoranda of Understanding for cooperation on climate change.

Opinion tracking between October and December 2002 showed stable overall majority support for Canada committing to the Kyoto Protocol. Strong majorities agree that: global warming is a serious threat; Canada should play a lead role in pushing for an international reduction of pollution; and, meeting Kyoto targets will go a long way toward protecting the environment. However, 68% of Canadians reported that they have only a moderate understanding of the issues involved in climate change and the Kyoto Protocol.

The International component continued its contribution to Canada's global climate change objectives in the international negotiations process. For example, the rules and modalities that were successfully adopted at the Conferences of Parties held in Bonn (July 2001) and Marrakech (November 2001) have set in motion the Clean Development Mechanism and Joint Implementation, two Kyoto market mechanisms that will maximize opportunities for Canadian businesses to participate in international climate change projects.

Canada's influence has continued to grow with Developing and Least Developed Countries, especially the Francophone Group. Canada was also instrumental in launching the debate on future global climate change regimes in the Annex 1 Expert Group of the OECD. Work in forestry, mechanisms, technology transfer and other international areas helped to further Canada's goals at home and abroad.

The Public Education and Outreach program was very active with high-profile advertising and the funding of numerous projects through Hubs, the General Public Stream, the Youth and Educators Stream, the Communities Stream and the Business and Industry Stream. Projects included outreach in Canada's Chinese-speaking communities, teaching climate change science in elementary and high schools and demonstrating the benefits of "no vehicle idling" workplaces.

In the area of science, accomplishments included: ongoing funding for climate modelling and the Canadian Climate Impacts Scenarios Facility; nine new research projects on the theme of climate system processes and two new projects examining scenarios of climate variability and extremes; support to the International Dendrochronology Conference in Quebec City, August 2002; support for the IPCC international meeting on CO₂ capture and storage in Regina, November 2002; and, preparation of fact sheets on the themes of climate system monitoring, climate modelling and the Arctic.

Projects funded by the impacts and adaptation section are helping to increase understanding of Canada's vulnerability to climate change, and to provide information for decision makers facing near-term adaptation decisions. Funding was provided for 23 new projects in the areas of human health, coastal zone management and forests. Two large integrated projects were also supported: a study on water resources in the South Saskatchewan River Basin and a multi-agency project to quantify the impacts of sea-level rise and climate change on the coastal zone of south-eastern New Brunswick.

Technology Early Action Measures (TEAM) continues to be one of the primary tools for implementing federal climate change policy. There were 15 new projects launched, and leveraging of \$150 million in total new investments, based on \$18 million from TEAM and \$32 million from other federal sources.

Under the CCAF Reserve, funding has helped BIOCAP Canada to coordinate national, university-based research networks with federal scientists and others to address questions surrounding biosphere greenhouse gas management. The Prairie Farm Rehabilitation Administration (PFRA) worked to help producers understand agricultural sources of greenhouse gases and mitigate the effects of climate change. A booth at Americana 2003, an international

environmental trade show held in Montreal, highlighted the Government of Canada's actions on climate change. Funding for the Prairie Adaptation Research Collaborative is supporting many projects, including an examination of the impact of climate change on water supply and demand in the South Saskatchewan River Basin of Alberta and Saskatchewan.

Climate Change Action Fund: History and Mandate

Recognizing that climate change is among the most serious environmental challenges of our time, and further recognizing that such serious challenges require a variety of actions and approaches, the Government of Canada established the Climate Change Action Fund (CCAF) in the 1998 federal budget.

Under the CCAF, \$150 million was allocated over three years to help develop a national implementation strategy and to support early actions to respond to climate change. Meeting these goals involved building on existing programs, and establishing partnerships on climate change with provinces, territories, stakeholders and others.

During the 1998-2001 period, CCAF had four integrated components: Foundation Building, Technology Early Action Measures (TEAM), Science, Impacts and Adaptation (SIA) and Public Education and Outreach (PEO).

There were a number of accomplishments in the first three years, such as:

- The development and launch of the *National Implementation Strategy*, the *First National Climate Change Business Plan* and the *Government of Canada Action Plan 2000 on Climate Change*;
- Analysis and modelling to evaluate the economic and environmental implications, for Canada, of various approaches to achieving the Kyoto target and to assist in the development of a future course of action;
- Practical and visible demonstrations of climate change technologies that support sustainable economic development through TEAM, where an initial investment of \$60 million leveraged an additional \$500 million from private sector partners;
- Funding of cost-shared climate science, impacts and adaptation research that engaged scientists and stakeholders while significantly increasing the knowledge base on climate system functions, potential impacts and adaptation techniques; and,
- Reaching over two million Canadians to increase awareness of the issue.

Given the success of the first three years, the Government of Canada moved to a second phase of CCAF in Budget 2000 with \$150 million in funding in a three-year mandate that ends in fiscal year 2003-2004.

Details on results and activities during the second year of that mandate are provided in this report: *Building on Success, The Climate Change Action Fund 2002-2003 Annual Report*.

CCAF Structure and Administration

The central administration of the Climate Change Action Fund is undertaken by the federal Climate Change Secretariat. There are lead departments for each component, and some components have different sub-categories involving a large number of federal departments.

Environment Canada and Natural Resources Canada are overall lead departments for the CCAF. Substantial contributions are made, and resources committed, by Transport Canada, Agriculture and Agri-Food Canada, Statistics Canada, Department of Finance, Health Canada, Industry Canada, the Department of Foreign Affairs and International Trade, Fisheries and Oceans Canada, the Canadian International Development Agency and Indian and Northern Affairs Canada.

The CCAF operates on the basis of the following principles: to build, where possible, on existing initiatives and mechanisms; to leverage and share costs with provinces/territories and the private sector; to ensure there are concrete milestones and demonstrable results; and to establish transparent processes that engage all federal departments, as well as agencies and external stakeholders.

These operating principles underscore the five components for the 2001-2004 period:

Building for the Future: Building for the Future is designed to support domestic efforts across sectors, governments and society to address climate change, to position Canada to take future policy decisions on approaches and options for achieving climate change commitments, and to assist in meeting international reporting obligations on greenhouse gas emissions. In this component, there is support to both the federal coordination and the national climate change processes; investments are made in data gathering, analysis, modeling and policy development; and there are public consultations and communications activities.

International Policy and Related Activities: The International component helps Canada maximize its ability to meet its Kyoto emissions reduction commitment at the lowest cost through use of the Kyoto mechanisms. It helps to secure favorable terms for sinks and other measures, and contributes to global climate change objectives by advocating the engagement of all countries to deal with global emissions reductions in a future climate change régime. It ensures a level playing field with Canada's competitors by maximizing participation of key developed and developing economies in the Kyoto Protocol, and maximizes opportunities for Canadian business in international projects and initiatives aimed at addressing climate change.

Public Education and Outreach: Public Education and Outreach (PEO) is designed to raise Canadians' awareness of climate change, and promote action in each province and

territory. It funds a variety of projects, such as Internet sites, museum displays and classroom materials. Within this component are the Hub Network (provincial/territorial centres of PEO information and coordination) and project funding. The partnered projects are in four streams: Communities (to encourage municipal action and community greenhouse gas reduction strategies); Youth and Educators (to increase teaching of climate change in kindergarten through grade 12, and to engage the energy and values of youth as a catalyst for action); Business and Industry (to encourage management and employees to reduce greenhouse gas emissions); and the Public (to increase Canadians' understanding of climate change and take individual action).

Science, Impacts and Adaptation: Science, Impacts and Adaptation is designed to assist in advancing knowledge of the magnitude, rate and regional distribution of climate change and its impact on Canada, and to increase the country's capacity to adapt. Examples of activities are global and regional-scale climate modelling; production of climate scenarios for impacts and adaptation researchers; research on the key climate system processes of importance to Canada; assessment, evaluation, coordination and communication of climate system science; impacts and adaptation research to provide new insights on Canada's vulnerability to climate change in areas such as water resources, health, and food supply in all regions of the country; and contributing to the development of adaptation strategies. The latter is especially important in regions and sectors where impacts are currently being felt, and where decisions taken now have long-term implications.

Technology Early Action Measures (TEAM): TEAM offers support to federal programs that fund technology projects to reduce greenhouse gas emissions nationally and internationally, while sustaining economic and social development. TEAM brings together partners from all levels of government, industry and communities. Eligible projects demonstrate innovation in transportation, energy, agriculture and various industrial sectors, involving Canadian industry to reduce greenhouse gas emissions, supporting community-based reduction technologies and transferring technologies to other countries (particularly developing nations).

In addition to the five components, the CCAF Reserve is used to fund projects that fall beyond the scope or budgets of the five core areas.

Report on 2002-2003 CCAF Activities and Results

Activities and results are presented by CCAF components, and include a brief explanation of the component, an overview of the past year and some highlights of specific activities.

Building for the Future

Building for the Future supports the National Climate Change Process and the development of federal policies to address climate change...

Building for the Future provides the primary source of support for the National Climate Change Process. This support for national and coordinated federal policy development work informs Canada's decisions on approaches and options for achieving climate change objectives; it supports greenhouse gas emissions inventory and reporting activities required to meet international reporting obligations; and includes broad climate change communications activities.

National Climate Change Process

Following through on the 1997 commitment of First Ministers, the National Climate Change Process (NCCP) was established in 1998 to develop a national response to climate change and to examine the consequences of the Kyoto Protocol to Canada. Managed jointly by the federal, provincial and territorial governments, the national process involves all levels of government as well as industry, environmental groups, communities, individuals and other stakeholders.

The federal government's contribution to the national process was accomplished through a variety of activities funded by CCAF aimed at the effective operation of national process mechanisms. Mechanisms include: the Joint Meeting of Ministers of Energy and Environment (JMM), a committee of federal-provincial-territorial energy and environment ministers; the deputy minister-level National Air Issues Steering Committee (NAISC); the National Air Issues Coordinating Committee - Climate Change (NAICC-CC); and a variety of working groups. These national working groups focused on issues such as analysis and modelling, domestic emissions trading, and targeted measures. They continue to focus on impacts, adaptation and technology. The federal contribution to the national process involved coordination and development of federal positions, and provision of analysis, modelling and policy development expertise.

Since ratification of the Kyoto Protocol, many aspects of the NCCP have been in abeyance. The focus has been on rebuilding federal-provincial-territorial cooperation on climate change, primarily through bilateral relationships.

Highlights from the 2002-2003 period include:

- two Joint Meetings of Ministers of Energy and Environment, in May 2002 and October 2002, ensuring jurisdictional engagement prior to Kyoto ratification;
- release of *Canada's National Climate Change Business Plan 2002* in May 2002 that included climate change measures and initiatives from federal, provincial and territorial

- governments as well as municipalities and the private sector;
- a series of national stakeholder workshops, held in June 2002 in 14 cities throughout Canada, which involved federal, provincial, territorial governments, non-government groups and associations, the private sector and individuals and focused on the federal *Discussion Paper on Canada's Contribution to Addressing Climate Change*; and,
- bilateral federal-provincial-territorial work in the latter part of the year, included deputy-minister level meetings, to discuss climate change priorities and development of Memoranda of Understanding for Cooperation on Climate Change.

Federal Policy and Coordination

A number of federal departments and agencies have climate change responsibilities, and work collaboratively in the development of federal climate change strategies. Coordination of these federal efforts, along with support for policy development and central management of horizontal and other climate change initiatives, were performed by the Climate Change Secretariat (CCS). In the latter six-month period of 2002-03, the CCS worked with the Privy Council Office in performing these functions.

Key accomplishments in 2002-03 included:

- the development of the Climate Change Plan for Canada and strategy for its implementation;
- policy work surrounding the “ratification” decision made in December 2002; and,
- management and coordination of weekly interdepartmental Climate Change Management Committee meetings and other interdepartmental mechanisms for federal climate change policy development.

Domestic Emissions Trading (DET)

The design considerations for a DET system in 2002-2003 came to focus on how permit and credit trading could provide companies in the Large Final Emitters (LFE) sectors with enhanced flexibility and cost savings in meeting their emission reduction targets under negotiated covenants.

Building on the largely conceptual work on DET options in Canada over the past four years, and based on on-going engagement with industry stakeholders, the 2002-2003 effort resulted in more detailed options for:

- output-based allocation of permits to those sectors;
- use of credits or offsets from uncovered sectors by LFEs to meet their targets;
- governance of a trading system, including federal, provincial and territorial arrangements for implementation;
- further analysis of linkages between a future DET system and the Kyoto Mechanisms; and,
- monitoring, verification and reporting requirements for LFEs; and,
- coverage of LFE sectors of the economy projected to account for 44% of Canada's emissions in 2010.

Targeted Measures

In the lead-up to the ratification decision, considerable emphasis was placed on understanding the potential economic consequences of taking action to address climate change. The Targeted Measures Coordination Group, a federal-provincial-territorial working group under the National Climate Change Process, was charged with developing policy measures that could be simulated in national analytic efforts led by the Analysis and Modelling Group.

In previous modelling work, it was often difficult to understand the stand-alone impacts of various targeted measures because of the interactions between measures and model feedbacks, and because the results were often presented at a broad sectoral level. For these reasons, it was difficult to determine if models were simulating targeted measures correctly, or whether the measures themselves, at an individual level, were likely performing as anticipated.

The Coordination Group contracted with Policy Assessment Corporation and the Canadian Energy Research Institute for simulations of individual measures on a stand-alone basis using the Energy 2020 model. Provinces and territories were engaged in this work. The results allowed for refinements to modelling of individual measures that have been incorporated into other modelling processes. There is now a better overall sense of how effective various targeted measures might be.

Analysis and Modelling

Understanding the impacts of policy design and implementation of potential options to address Canada's climate change objectives was further advanced through work under the federal-provincial-territorial Analysis and Modelling Group (AMG), and by federal departments working to develop a federal climate change plan.

In addition to furthering the work of the Targeted Measures Coordination Group in 2002-2003, the AMG has focused on enhancing the integrated modeling capacity needed to analyze and evaluate the economic and environmental consequences of climate change policy initiatives.

Highlights of work undertaken in 2002-03 include:

- substantial progress by Natural Resources Canada to enhance analytic capability through conversion of the U.S. National Energy Modelling System (NEMS) for Canada, with completion expected in 2004. The new model will be used for subsequent energy and emissions projections and will provide the integrated framework for policy analysis;
- improvements to Environment Canada's Criteria Air Contaminants (CAC) estimation methodology and to the capacity of the Energy 2020 model to estimate changes in CAC emissions, as well as greenhouse gas emissions in the electricity sector;
- further development and application of a source-receptor tool to estimate changes in ambient air concentrations from changes in CAC emissions and an improved Air Quality Valuation Model (AQVM) that will provide better estimates of the benefits of reductions in ambient concentrations of criteria air contaminants;
- improved Energy Supply-Demand Balances at Statistics Canada that are central to

- greenhouse gas calculations and policy development;
- filling data gaps and enhancing analytical tools at Agriculture and Agri-Food Canada so there can be more detailed and policy-relevant information on agricultural greenhouse gas emissions and sinks for incorporation in the Climate Change Plan for Canada. An assessment of the environmental co-benefits of greenhouse gas mitigation strategies in the agriculture sector is near completion; and,
- improved modelling capacity and addressing data and analytical gaps at Transport Canada has helped with developing a national perspective on climate change transportation solutions. For instance, in-depth economic analysis of the non-monetary costs and benefits of reducing greenhouse gas emissions in the passenger and freight transportation sectors, and a study to indicate how urban transit could help mitigate climate change.

Northern Strategies

The CCAF provides cost-shared support to initiatives aimed at developing strategies and options to address climate change in Canada's north. Three multi-year initiatives, one in each of the territories, have been funded in the past. Only one of these initiatives remained active in 2002-03: that of ongoing operation of the Northern Climate Exchange (NCE), established to develop shared understanding and promote action on climate change in the Yukon and circumpolar north.

International Reporting Obligations

As a party to the *United Nations Framework Convention on Climate Change* (UNFCCC), Canada must meet international reporting obligations related to greenhouse gas emissions inventories, and carbon sources and sinks. Additional, more robust reporting requirements will come into force under the Kyoto Protocol. CCAF-supported activities ensure that Canada can continue to meet its current and ongoing reporting obligations, and is positioned to meet new obligations that would be required under the Kyoto Protocol.

Greenhouse Gas Inventories

The national greenhouse gas inventory is the ultimate measure against which a country will be judged in reporting under the UNFCCC, and under the Kyoto Protocol in the future. Progress will be measured through the use of a set of inventory methodologies and reporting guidelines agreed to by Framework participants.

As an interim step towards a reporting system under the Kyoto Protocol, enhanced reporting requirements have been agreed to under the UNFCCC. Annex 1 Parties are now required to report and publish an annual National Communication, consisting of an inventory of greenhouse gas emissions and removals, as well as a national inventory report that includes sectoral trends analysis. In addition, there is a requirement to submit and publish an annual inventory report on Good Practice activities. These include quality assurance and control, internal verification procedures, uncertainty analyses, key source identification and trends correlation.

Efforts funded in 2002-2003 build on previously-funded CCAF activities and deal with scientific and technical work related to methods development, policy development, capacity building,

international and domestic reporting obligations, international review activities and the provision of guidance in the areas of sources and sinks of greenhouse gases.

Key accomplishments included:

- the establishment and maintenance of a formal national greenhouse gas emission reporting system;
- the preparation and publication of a detailed and updated National Inventory Report, including a Trends Analysis;
- a submission to the UNFCCC on Forest Products Accounting, outlining Canada's views on how forest products accounting should be done;
- the representation by experts in international negotiations and fora, including the planning and development of the Land Use, Land-Use Change and Forestry (LULUCF) work program of the Intergovernmental Panel on CC Task Force on National GHG Inventories;
- a capacity building project with China to meet its UNFCCC National Communications reporting obligations; and,
- the continuation of work through the Greenhouse Gas (GHG) Verification Centre to strengthen voluntary action across all sectors of the economy in order to pave the way for possible market-based instruments in the future.

Forest Carbon Stocks Measuring and Monitoring

Improvements to Canada's current information systems and data on forest carbon sources and sinks are needed to meet existing and future international reporting requirements. To this end, CCAF funds are directed towards: developing a framework and methodologies for Forest Carbon Measurement; establishing cost-sharing partnerships with provinces, territories and industry; data collection; identification of science gaps; and ensuring consistency in international reporting requirements.

The main components of the forest carbon stocks monitoring and measuring framework include: an upgraded Carbon Budget Model of the Canadian forest sector (CBM-CFS2); development of methods to monitor and track forest changes; and a new National Forest Inventory (NFI) to provide consistent assessment of the extent, state and sustainable development of Canada's forests.

Key accomplishments during 2002-2003:

- implementation of the National Forest Inventory through agreements between the federal government and the partner provinces or territories. Agreements were signed with British Columbia, Saskatchewan, Manitoba, Ontario, New Brunswick, Nova Scotia and Newfoundland;
- the Carbon budget model was prepared for national-scale projections of future carbon stock changes under different assumptions of forest management and natural disturbances. As well, there was considerable work done to support the National Sinks Committee to address consistency of reporting across operational to national scales;
- selected components of a forest change monitoring strategy have been tested to ensure compatibility with National Forest Carbon Accounting Framework in the area of forest change detection. There have also been several provincial deforestation trials analysed; and,

- remote sensing forest change detection and identification methods were developed and tested, including fire, insect and disease scenarios.

Communications

CCAF communications aims to broaden public awareness on domestic action to address climate change, as well as international progress. Equally important are communications activities that help Canadians understand the role they can play in reducing greenhouse gas emissions.

Highlights of 2002--2003 include:

- the release of a major print advertising campaign published in fall 2002 in Canadian daily newspapers and in ethnic and official languages publications;
- production and broadcasting of one segment of a major climate change television advertising campaign in support of ratifying the Kyoto Protocol and alerting Canadians to the availability of the Climate Change Plan for Canada;
- support to the production and distribution of the Climate Change Plan for Canada; and,
- public opinion research to gauge Canadians' reaction to the ratification of the Kyoto Protocol and to test their reaction to the print advertising campaign.

Support for ratification of the Kyoto Protocol by Canadians remained constant at between 75-80% through the Fall-2002 period leading up to the ratification of the Protocol, a time when several anti-Kyoto advertising campaigns were running. Public opinion research showed there was a 10% increase in awareness (from 48% to 58%) of the *Climate Change Plan for Canada* between Fall 2002 and March 2003. The *Climate Change Plan for Canada* was made available on the web, and since its release on November 21, 2002 there have been approximately 240,000 downloads of the Plan.

International Policy & Related Activities

The International component helps Canada maximize its ability to meet Kyoto commitments, contributes to global climate change objectives and maximizes opportunities for Canadian business in international projects and initiatives on climate change...

International Policy and Related Activities in climate change are delivered by the Department of Foreign Affairs and International Trade, the Canadian International Development Agency, Environment Canada, Natural Resources Canada, Industry Canada, and Agriculture and Agri-Food Canada. Each has a special area of expertise and set of deliverables.

Following the historical deals reached at the Bonn and Marrakech Conferences of the Parties in 2001, Canada was instrumental in launching the debate on a future global climate change regime in the Annex I Expert Group of the OECD, and by commissioning unique International Energy Agency (IEA) research on the subject.

Another key achievement was the encouragement of world research by academic centres of excellence on a strategic analysis of the Kyoto Protocol as developed under the Bonn and Marrakech Accords. A series of studies were undertaken to initiate an international science-

policy dialogue on options for an effective and equitable long-term global climate change regime. In addition, contributions were made to selected priority countries to establish a Clean Development Mechanism national authority and to build their capacities for projects that could be developed with Canadian investment and participation. This assistance was targeted at countries that could play a pivotal role regionally on market accessibility for Canadian climate change investors.

Developing countries

Developing country engagement activities now encourage more than fifty developing countries to better understand and support Canada's positions on climate change negotiations. Canada's influence within the G-77/China negotiations group, especially the Least Developed Countries (LDCs), the Francophone Group and the African group, has grown considerably. Canada contributed directly to the UNFCCC negotiations process by lending support to the UNFCCC Secretariat to pay for the participation of developing country negotiators, especially the Least Developed Countries, at key workshops and seminars, with a view to implementing key decisions made by the Conference of the Parties. In sum, a main highlight in this area was Canada's contribution to the opening of an informal dialogue on future emission reductions by G-77 countries, especially the larger emitters.

There were negotiations on the development of three new special funds. The Least Developed Countries Fund, the Special Climate Change Fund and the Kyoto Protocol Adaptation Fund are essential to gaining support from the G-77 and China for the conclusion of negotiations of the Buenos Aires Plan of Action (BAPA). The Canadian International Development Agency was heavily involved in the negotiations for the LDC Fund and made a \$10M contribution to get activities going. CIDA also contributed to the development and adoption of guidelines for the preparation of National Adaptation Programmes of Action that allow LDCs to identify their urgent adaptation needs and access funding to address them.

In addition, analysis work was done on the potential for establishing private-public partnerships in order to provide insurance to developing countries against the impacts of climate change. Different financial products can be used to creatively address vulnerability and therefore losses in developing countries related to climate events.

Common Approaches

Canada was instrumental in launching the debate on a future global climate change regime in the Annex I Expert Group of the OECD. The Group aims for a common approach among OECD countries on addressing the greenhouse gas mitigation question in the Second Commitment period of the Kyoto Protocol (2013-2018).

The successful outcome of the Conferences of the Parties was the result of extensive participation in workshops and meetings leading up to the key sessions. As a result, Canada was able to both maintain and increase its presence and role in the negotiation process, and to promote and protect its interests.

Sinks and Forestry

Promoting the Canadian Government's programs and private sector capabilities related to climate change was an important accomplishment, along with close involvement in International Sinks analysis for negotiating positions, and Sinks promotion activities.

As detailed in the Building for the Future Section of this report, the National Forest Sinks Committee continued its collaborative work.

CCAF funds supported on-going participation of Canadian Forest Service scientists in the key work of the Intergovernmental Panel on Climate Change, ensuring that Canada's circumstances and forest characteristics will be reflected in the development of scientific guidance for measuring forest carbon. For instance, there was a side-event at Conference of the Parties CoP8 sponsored by Canada to explain the development of Canada's carbon measuring and reporting system with assistance from the Canadian Forest Service and Agriculture and Agri-Food Canada. Financial support was given for a workshop in Brazil on rules regarding afforestation and reforestation in the Clean Development Mechanism that helped advance negotiations on this issue.

The Government of Canada provides lead authors, as well, in the preparation of IPCC reports such as those on land use, land-use change and forestry; and the definitions and methodological options to inventory emissions from direct human-induced degradation of forests.

Cleaner Energy Exports

Canada has worked hard at the international table to seek credit for its exports of cleaner energy (such as natural gas and hydroelectricity). These exports (which go to the US – a non-party to the Kyoto Protocol) reduce emissions because they displace more-carbon intensive fuels that would otherwise be used in the US. Despite the global benefits, Canada bears the burden of the associated production and consumption emissions. Because of the substantial analytical work that was accomplished, we were able to clearly articulate our position at a UNFCCC workshop hosted by Canada. The policy and analytical work undertaken was also used to position Canada at various international negotiating sessions. Although Canada has not been successful in obtaining credits thus far, the international community has a much greater appreciation of the situation Canada is facing as a large energy exporter.

Technology transfer

By participating in the UNFCCC Expert Group on Technology Transfer, Natural Resources Canada contributed to efforts to create the conditions necessary for the adoption of climate-friendly energy technologies in the developing world. This is part of Canada's broader efforts to foster the longer-term engagement of developing countries in addressing climate change.

CH4MIN

Licensing has been completed on international credits with a private sector partner now engaged in using a new and innovative technology known as CH4MIN to capture methane in emissions in air vented from coal mines. The technology has significant emissions reductions possibilities.

Public Education and Outreach (PEO)

Public Education and Outreach helps raise Canadians' awareness of climate change, and promotes action in each province and territory

Government of Canada-Led Awareness

Public education and outreach (PEO) activities continued to help increase awareness and understanding of climate change among Canadians, and to encourage them to take action to reduce their greenhouse gas emissions.

Highlights from 2002-2003 include:

- The “*Climate Change. Are you doing your bit?*” advertisement ran as part of a Globe and Mail climate change newspaper supplement in May 2002, and in Montreal’s La Presse newspaper reaching more than one million Canadian readers. Canadians ordered roughly 18,500 climate change publications, including copies of the “*Climate Change. Are you doing your bit?*” information kit.
- An advertisement promoting the One-Tonne Challenge for individuals ran in an issue of *Time* magazine with an insert on energy efficiency, in March 2003.
- In Atlantic Canada, a series of eight 30-second public service announcements aired on 13 English and French radio stations from February to July 2003.
- Over 30,000 people were drawn to a climate change PEO booth at major exhibits and conferences across Canada, including four exhibition events with the Communication Canada program (Pacific National Exhibition, Canadian National Exhibition, Montreal National Home Show and the Canada Games). Visitors were able to try an electronic quiz on climate change and talk directly with the staff on various issues. A new interactive quiz for kids was designed and tested very well at the “Faces of Canada” event held in Prince Edward Island.

Hubs

The Hubs are centres, piloted in the regions, that bring together all levels of government, business, academia, environmental groups and other stakeholders to coordinate and extend the reach of climate change outreach programs at the provincial/territorial and local levels. The Hubs are linked nationally through the Hub Pilot Advisory Team (HPAT), where there is opportunity to share best practices and lessons learned about climate change outreach. The HPAT includes representatives from the Hubs, Aboriginal groups, academia, private sector and non-governmental organizations.

Highlights from 2002-2003:

- Ten Hub pilots in place across Canada, except in Ontario, Quebec and Nunavut and pilots have been extended until March 31, 2004 in New Brunswick, Saskatchewan, Nova Scotia and the Northwest Territories.
- The Nova Scotia Hub partnered with Wilson's Fuel to develop a brochure giving Canadians transportation tips on how to save money by reducing greenhouse gas emissions. Wilson's Fuel distributed the brochure to clients through gas stations in Nova Scotia, New Brunswick and PEI. The Saskatchewan Hub has made efforts to reach out to other groups, particularly First Nations and farmers through science fairs and trade shows.
- Over the last year, the NWT Climate Change Centre has formed partnerships with both the Dene Nation and Ecology North to assist in the delivery of their projects. The Centre created the "Healthy Families, Clean Environment, No Idling" campaign, developed and delivered a territory-wide television Public Service Announcement (PSA) contest for high school students.

Funded Projects

The renewed CCAF-PEO program (2001-2004) has made the transition from an open approach to one of a targeted investment that builds on successes, fills gaps, and creates and supports critical links with other Government of Canada initiatives under way as a result of the First National Business Plan on Climate Change and Action Plan 2000.

The release of the Climate Change Plan for Canada in 2002 has also established a goal for every Canadian. Considering the fact that each Canadian produces an average of five tonnes of GHG emissions annually, the Government of Canada will challenge Canadians to reduce their GHG emissions by one tonne. This is the One-Tonne Challenge, and all partners, Hubs and project proponents have been asked to include it in their activities.

General Public Stream

The General Public Stream is designed to increase Canadians' understanding of climate change, including the science, national and regional impacts and the need for adaptation, as well as to motivate individual actions. Projects were funded for innovative and interesting information products, tools and initiatives to educate Canadians about climate change.

Highlights of 2002-2003:

- *Raising Climate Change Awareness in Chinese Speaking Communities.* The West Coast Environmental Law Research Foundation is conducting a social marketing campaign in British Columbia on global warming and climate change to Chinese Canadians whose mother tongue is Chinese.
- *Climate Change and Health Primer.* Pollution Probe is producing a science-based publication to increase awareness and improve understanding of how health is affected by climate change, and the need to take mitigation and adaptation actions.
- *Energy Solutions Handbook.* The Energy Solutions Centre is developing for distribution a handbook on climate change information and incentives for practical solutions to reduce sources of residential GHG emissions.

- Projects that are designed to place an exhibit on the science of climate change in a museum or science centre in every province and the Yukon. For instance, the Calgary Science Centre's *One World*, an exhibit on sustainable living and climate change. The Yukon Beringia Interpretive Centres' *Two Million Years of Climate Change* explore climate change from the last Ice Age to the present day, and looks to the future.

Youth and Educators Stream

The Youth and Educators Stream is designed to increase teaching of climate change in Canadian classrooms from kindergarten to grade 12, and to encourage youth to promote action on climate change. There are eight education initiatives aimed at teachers and students across Canada being supported by CCAF.

Highlights from 2002-2003:

- The Yukon Conservation Society's *Pan-Northern Climate Change K-12 Curriculum Project* aims to increase the teaching of climate change in K-12 classrooms in the Northwest Territories, Nunavut and the Yukon.
- The University of Winnipeg is leading the creation and piloting of climate change resource material at a variety of grade levels.
- *Science Alive Climate Change Workshop and Summer* at Simon Fraser University has hands-on activities, demonstrations and discussions aimed at grades 3-7.
- *Young Workers and Climate Change* under the Canadian Labour Congress Youth Committee aims to increase the level of knowledge and understanding of young workers on climate change, and its impacts while promoting measures to minimize the repercussions of climate change in their workplace and communities.

Communities Stream

The Communities Stream is a key component of the CCAF-PEO as communities are both target audiences and important partners in implementing projects. Studies have shown that efforts at the local level are highly successful in stimulating action. It aims to encourage municipalities to establish and implement greenhouse gas reduction strategies, encourage community-driven energy and transportation demand management activities and to promote PEO best practices in municipal and community greenhouse gas reduction initiatives.

Highlights from 2002-2003:

- The *Ecology Action Centre's* project, *Promoting Sustainable Transportation in Nova Scotia*, represents an expansion of the highly successful TRAX project based in the Halifax Regional Municipality and includes trip reduction programs, a Universal Bus Pass system and general transit promotion, and a sustainable transportation media campaign.
- La Chambre de commerce et d'industrie de Laval will implement the Allégro Laval Program to improve transportation services currently provided by the Société de transport de la Ville de Laval.

Business and Industry Stream

The Business and Industry Stream aims to engage those communities in working with management, employees and communities to communicate and encourage actions to reduce greenhouse gas emissions, as well as to demonstration to Canadians their role and actions on the issue.

Highlights from 2002-2003:

- The *Idle Free Workplaces* project demonstrates the benefits of implementing Idle Free fleet policies and influences employees in their personal travel habits. Collaboration and networking with the City of Vancouver, British Columbia Automobile Association, Insurance Corporation of British Columbia and Young Drivers of Canada driving school was central to project development.
- *Greenest City's Cool Shops* program works with retailers that face the street in Toronto neighbourhoods to identify and implement in-store energy management measures that yield a reduction in energy use and savings from lowered utility costs.

Science, Impacts and Adaptation (SIA)

Science, Impacts and Adaptation is designed to assist in advancing knowledge of the magnitude, rate and regional distribution of climate change and its impact on Canada, and to increase the country's capacity to adapt

Science, Impacts and Adaptation is divided into two sections. The Science section is led by Environment Canada, while Impacts and Adaptation is led by Natural Resources Canada. CCAF projects and activities were funded in both areas.

Science

In the second phase of the CCAF, the Science section has targeted the themes of climate system processes, climate modelling, climate scenarios, and assessment/evaluation. During 2002-03, 18 new projects were initiated, bringing the total number funded under Science to 22. University-based researchers led almost half of these projects, with 14 universities involved in all supported projects. In addition, support continued to be provided to university and government-based Canadian scientists involved in the work of the Intergovernmental Panel on Climate Change (IPCC). BIOCAP Canada Inc., a not-for-profit organization based at Queen's University in Kingston, Ontario that is addressing scientific questions surrounding biosphere greenhouse gas management also receives support. For details on BIOCAP, see the section entitled "CCAF Reserve".

Accomplishments of the CCAF science sub-component during 2002/03 include:

- Projects investigating climate system processes to help address critical gaps in understanding and contribute to the improvement of climate system models. Aspects being researched include the importance of the Arctic in the global climate system; the properties of clouds and aerosols and snow related processes with respect to climate models; and, the use of satellite imagery to determine detailed land surface reflectivity of sunlight.

- On-going support to expand modelling expertise and capacity at the Canadian Centre for Climate Modelling and Analysis (CCCma) at the University of Victoria. This includes climate-chemistry interactions and biogeochemical processes, as well as an improved ocean component and a better representation of aerosols and their interaction with radiation.
- Increasing the range of products from the Canadian Climate Impacts Scenarios Facility. Primary among these were climate change scenarios based on the output from Global Climate Model (GCM) experiment results of models from countries such as the United States and the United Kingdom. These scenarios, available on the CCIS web site (<http://www.cics.uvic.ca/scenarios>) complement those already available for the Canadian GCM. A scenarios training workshop for the user community was held in Vancouver.
- Other scenarios research was launched including the development of climate change scenarios tailored to the agricultural community, high-resolution scenarios of precipitation for western Canada, and statistical techniques required for the analysis of extreme events from climate model outputs. A workshop was also held to address the development of paleoclimate scenarios for impacts and adaptation research.
- An important meeting of international experts was held in Regina, Saskatchewan, from November 18 to 22, 2002, to develop a scoping paper on carbon capture and storage for the Intergovernmental Panel on Climate Change (IPCC).
- Participation by Canadian graduate students in the International Dendrochronology Conference held in Québec City, 22-27 August 2002. This conference took stock of the latest worldwide developments in dendrochronology with respect to global environmental change including climate change.
- Preparation of three fact sheets - climate system monitoring, climate system modelling and the Arctic.

Impacts and Adaptation

Reducing vulnerability to climate change, or capitalizing on benefits, requires knowledge of future impacts and the processes and means by which Canadians adapt, and likely future impacts. It also requires an understanding of the roles for individuals, the private sector and government. Projects funded by the Impacts and Adaptation section were designed to increase understanding of Canada's vulnerability to climate change, and to provide information for decision makers facing near-term adaptation decisions. In this phase of the CCAF, additional focus has been placed on understanding the process of adaptation.

Examples of the project funded and work supported under impacts and adaptation include:

- Twenty-three new projects in the areas of human health, coastal zone management, and forests. The new projects explore issues related to current climate variability and those anticipated to be of concern in the future as a result of climate change. They include the study of the risks of changes in: the occurrence of insect borne diseases, such as Lyme disease; sea level rise in the Fraser River delta, affecting the Greater Vancouver Region; and forest fire management in a changing climate.
- More than 20 new scientific papers and reports arising from impacts and adaptation projects supported during the first phase of the CCAF were published;
- Two large integrated projects demonstrating the complexity of the issues and the breadth of skills and knowledge that are needed in order to examine the implications of climate change

for Canada. The *Water Resources in the South Saskatchewan River Basin* study will document the vulnerability of water supply in a region that is presently subject to frequent severe drought, the demands of the multiple uses and potential conflicts of the water (agriculture, recreation, energy, communities), inter-jurisdictional issues, and how we can enhance our ability to cope with future climate change. *Impacts of sea-level rise and climate change on the coastal zone of southeastern New Brunswick* is a multi-agency project that will quantify impacts of sea level rise, storm surges and coastal erosion on the Gulf of St. Lawrence coast of southeastern New Brunswick. Results will contribute directly to sustainable management planning, community resilience and the development of adaptation strategies.

Technology Early Action Measures (TEAM)

Technology Early Action Measures . . . TEAM . . . offers support to federal programs that fund technology projects to reduce greenhouse gas emissions nationally and internationally and brings together partners from industry, communities and all levels of government

TEAM continues to be one of the primary demonstration tools for implementing federal climate change policy. The program's unique approach, built on incremental financing and extensive networking, has brought together industry, community and international partners to encourage additional investment in innovative technology that reduces greenhouse gas emissions. TEAM operates under the leadership of Natural Resources Canada, Environment Canada and Industry Canada, with the participation of several other federal government departments.

In fiscal year 2002/03, TEAM continued to implement its mission to provide early action on climate change technologies through:

- Completion of successful SMART (System and Measurement and Reporting to TEAM) road-testing studies and development of several measurement and reporting plans. As a result, SMART has been adopted by other funding agents such as the Federation of Canadian Municipalities and Sustainable Development Technology Canada, and has allowed TEAM to develop and strengthen links to other international greenhouse gas verification organizations.
- The evaluation and approval of ten industry and five community projects in the transportation, buildings, electricity, industry and agriculture sectors.
- Leveraging of \$150 million in total new investments, based on \$18 million from TEAM and \$32 million from other federal sources.
- New project-based greenhouse gas reductions, estimated at over 275,000 tonnes of carbon-dioxide-equivalent with an even greater potential through commercialization and replication.
- Continued regional diversification with new projects in seven provinces and 14 Canadian cities, in both rural and urban environments
- The engagement of 52 private companies and organizations, 28 government agencies and research institutions, in Canada and abroad in new projects.
- TEAM projects have resulted in increased energy efficiency and domestic sources of renewable energy that will improve urban air quality and provide stability to the continental energy supply. Smog and air pollution will also be addressed through TEAM's transportation-related projects, including those supporting a hydrogen economy.

Highlights of technical results for 2002/03

- Installation and commissioning of a 750 kW wind turbine in Exhibition Place in Toronto, with an effective community-based co-op model to develop “green” energy sources (Toronto Renewable Energy Co-op: WindShare)
- Deep lake water-cooling project launch with the capability to meet 40% of the cooling requirements of the downtown Toronto core
- Developed personal fuel appliance (PFA) prototypes that produced hydrogen gas that is 99.99% pure. The produced hydrogen fuel is considered as acceptable for fueling Ford, Daimler and Nissan hydrogen vehicles (Stuart Energy)
- Developed a new award-winning twin turbine refrigerant compressor. Chillers equipped with the compressor are more than 30% more energy efficient than comparable equipment that uses traditional compressors (Turbocor)
- Commissioned the City of Gatineau’s newly-refurbished, 400 kW, Eco-Musée hydro site in April 2003. CETC-O conducted computerized fluid dynamics work for civil work design modifications as part of this TEAM project (Gestion Conseil S.C.P, City of Gatineau).
- Launched Canada’s first solar neighborhood in the Kitchener-Waterloo region with the opening of the solar model home for public visitation. Total installed power will be at least 45 kW (Arise Technology, Cook Homes and partners).
- The completion of three pilot audits of natural gas plants in Alberta, resulting in identification over 70 potential energy and environmental efficiency improvement opportunities for the companies to evaluate. Immediate follow-up action by one plant resulted in immediate energy cost savings of an estimated \$500,000/year and a reduction in greenhouse gases of 5300 t/year (CETAC-West, audit and industry partners).

CCAF Reserve

The CCAF Reserve was established to fund projects that fall outside the scope or budgets of the core areas.

BIOCAP Canada is a not-for-profit organization with membership from provincial and federal government, industry, academia and other non-governmental organizations. Housed at Queen’s University, BIOCAP Canada is coordinating a series of national, university-based research networks that will collaborate with federal scientists and others to address scientific questions surrounding biosphere greenhouse gas management. Peer-reviewed, collaborative research has been under way in several important areas with substantial partner funding committed and new sponsors and partners brought on board. BIOCAP’s effort to coordinate, fund and communicate bio-based research was facilitated by the development of four Research and Development Advisory Committees. A new BIOCAP bilingual website (www.biocap.ca) was developed and launched and the first issue of *Carbon Copy*, a quarterly newsletter, was sent electronically to a database of over five thousand researchers and stakeholders.

The Prairie Adaptation Research Collaborative (PARC) was established in 1999 to facilitate networking and research to advance knowledge of the vulnerability to climate change in Alberta, Saskatchewan and Manitoba. A major project, co-funded by Saskatchewan Environment,

examined management options for “island forest” areas of the southern prairies in the face of climate change. These sites are of key recreational and ecological importance. Two major projects examining the impact of climate change on water supply and demand in the South Saskatchewan River Basin of Alberta and Saskatchewan were also supported. In this key agricultural area water resources are already under stress due to recurrent drought. Responding to emerging needs of impacts and adaptation researchers and stakeholders, PARC co-funded a workshop held in Winnipeg examining the impact of climate change on prairie transportation systems, with particular emphasis on current problems with seasonal roads in northern Manitoba. PARC also continues to develop innovative ways of delivering climate change impacts and adaptation information and data via the internet.

At Americana 2003, a major international environmental technology trade show and conference which takes place in Montreal every two years, climate change was one of the themes of the event. Americana 2003 had 8000 participants from 57 countries. Canada's actions on climate change were highlighted in a Canada booth with the theme “Taking Action on Climate Change - Together, We Can Do It”. The booth displayed CCAF projects and distributed the *Climate Change Plan for Canada* and other climate change publications. It also featured an interactive quiz on climate change.

The CCAF Reserve helped fund the release of a major print climate change advertising campaign published in fall 2002 that encouraged Canadians to find out more about what actions they could take to address climate change and solicited their views on Canada’s draft climate change plan.

The Parties to the United Nations Framework Convention on Climate Change (UNFCCC) held a two-day workshop in Whistler, British Columbia on cleaner or less greenhouse gas (GHG)-emitting energy. Representatives from 31 countries, 15 businesses and environmental Non-Government-Organizations and 10 expert presenters attended the event organized by IEPD/NRCan with support from the CCAF.

The Prairie Farm Rehabilitation Administration (PFRA) is now in a partnership with the Canadian Federation of Agriculture, the Canadian Cattlemen's Association, the Eastern Canadian Soil and Water Conservation Centre, and the Soil Conservation Council of Canada. The partnership is working with producers to develop an understanding of agricultural sources of greenhouse gases and management practices that could mitigate effects. Among the results are numerous Environmental Farm Planning workshops across the nation, a conference delivered on agro-forestry and climate change, three issues of a newsletter developed and widely circulated, a catalogue of extension materials related to greenhouse gases for industry groups, academia and extension agencies, on-farm demonstrations in all provinces, a greenhouse gas calculator for cattle producers, numerous fact sheets and videos related to agricultural best management practice.

CAF Block/Program/Activity 2002-03	Actual Expenditures		
	Operating	Contributions	Total
	\$K	\$K	\$K
Building for the Future			
- Federal Coordination	2310	50	2360
- F/P/T Coordination and Consultations	3123	50	3173
- Communications	5650	100	5750
- Development/Analysis - DET	4547	0	4547
- Development/Analysis - Other Policy Options	2201	50	2251
- International Reporting Obligations	1574	800	2374
Subtotal	19405	1050	20455
International Policy and Related Activities			
Subtotal	2866	675	3541
Public Education and Outreach			
Subtotal	2450	3650	6100
Science, Impacts and Adaptation			
- Science	1748	875	2623
- Impacts and Adaptation	380	710	1090
Subtotal	2128	1585	3713
Technology Early Action Measures			
Subtotal	900	12570	13470
Reserve			
- PARC	5	0	5
- BIOCAP	0	811	811
- PFRA Awareness Initiative	199	317	516
- Cleaner Energy Meeting 2002	256	288	544
- AMERICANA 2003	10	490	500
- Advertising	2000	0	2000
Subtotal	2470	1906	4376
Total	30219	21436	51655

