Natural Resources Canada

Performance Report

For the period ending
March 31, 2005

R. John Efford
Minister of Natural Resources Canada

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Minister's Message

R. John Efford
Minister of Natural Resources Canada

I am pleased to present the Departmental Performance Report for Natural Resources Canada (NRCan) for the period ending March 31, 2005. This has been an important year for NRCan as we continued to help shape the enormous economic, social and environmental contributions of the natural resource sectors.

NRCan has been actively pursuing the Government of Canada's commitment to achieving a strong, environmentally sustainable economy through a wide range of programs and initiatives that promote the wise use and sustainable development of Canada's natural resources.

We were guided by the following five priority areas: knowledge, innovation and productivity; trade and investment; energy and the environment; northern and Aboriginal communities; and public safety and security. These priorities are evident in what was accomplished this year, as this report further details.

We expanded our role as a leading S&T department. Our cutting-edge geoscientific knowledge and innovative research are strengthening the competitiveness of the natural resource sectors. I'm particularly proud of our pioneering work in alternative fuels, renewable energy sources and energy efficiency that is helping to address climate change and bolstering Canada's place as a world leader in clean technologies.

This year, we increased our focus on promoting opportunity and building strong and sustainable communities through strategic partnerships with industry, the private sector and all Canadians. Beyond our borders, we also worked with our American counterparts on advancing the security of energy supply. In the international arena, we increased foreign market access and promoted Canadian expertise and know-how in the natural resource sectors.

Finally, NRCan remained committed to the highest levels of corporate management. For the first time, the Program Activity Architecture (PAA) was used to produce this report which better reflects how the department functions. I believe the PAA improves transparency and accountability which, in turn, should help Parliamentarians and Canadians better understand NRCan's contributions to the Government of Canada priorities.

I am proud of NRCan's achievements over the past year. We will continue to work to ensure that the natural resource sectors remain a vital part of Canada's economy and society, now and for the future.

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R. John Efford

Management Representation Statement

I submit for tabling in Parliament, the 2004-05 Departmental Performance Report (DPR) for Natural Resources Canada.

This document has been prepared based on the reporting principles contained in the Treasury Board Secretariat's *Guide for the Preparation of 2004-2005 Departmental Performance Reports*:

- it adheres to the specific reporting requirements;
- it uses an approved Program Activity Architecture;
- it presents consistent, comprehensive, balanced and accurate information;
- it provides a basis of accountability for the results pursued or achieved with the resources and authorities entrusted to the department; and
- it reports finances based on approved numbers from the Estimates and the Public Accounts of Canada.

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Nawal Kamel
A/Deputy Minister

_____
Date

Summary Information

NRCan is an economic, science-based department with a mandate to promote the sustainable development and responsible use of Canada's mineral, energy, and forestry resources; to develop an understanding of Canada's landmass; and to collect and disseminate knowledge on sustainable resource development and use. The department conducts research and technical surveys to assess Canada's resources, including the geological structure and legal boundaries. NRCan is also authorized to provide the national framework of reference for spatial positioning; prepare and publish maps; conduct scientific and economic research related to the energy, forestry, mining, and metallurgical industries; and to establish and operate scientific laboratories for these purposes.

Mission Statement – NRCan provides the knowledge and expertise for the sustainable development and use of Canada's natural resources and the global competitiveness of the resource and related sectors for the well-being of present and future generations.

NRCan also develops the new knowledge and technologies that are required to address the challenges of sustainable development in the energy, mining and forestry sectors. This includes the research, development and demonstration of technologies to reduce the environmental footprint of energy production, conversion and use.

Natural resources are a cornerstone of the Canadian economy, generating thirteen per cent of Canada's GDP, leading in innovation and productivity, and employing a million Canadians across the country, especially in rural, remote, and northern communities. NRCan plays a critical role in enabling sustainable development across Canada and promoting it around the world. NRCan supports a culture of innovation – applying cutting-edge technologies to add value to natural resources, investing in research and development, and promoting Canadian technologies and expertise abroad to build a 21st century economy.

In advancing sustainable development, NRCan is also a steward of the environment, a leader on addressing climate change, a responsible agent for northern development, and a catalyst for value-added research. Canada's natural resource sectors require a coordinated national approach sensitive to regional interests that serves a broader public good and provides opportunities for current and future generations.

Financial Resources - ($M)

Main Estimates	Total Authorities	Actual Spending
1,092.9	1,492.7	1,312.9

Human Resources

Main Estimates	Actual
4,356	4,356

Departmental Priorities

NRCan has one strategic outcome which is supported by four program activities. This report focusses on the key programs/services within the four program activities that are directly related to achieving our departmental priorities (see Section II).

Program Activities

1. Earth Sciences
2. Energy
3. Forest
4. Minerals and Metals

In the Report on Plans and Priorities for 2004-05, the department identified the following priorities: addressing climate change, building sustainable development capacity, and providing global leadership on sustainable development. While going through the RPP 2005-06 exercise, the department developed new priority themes which encompassed the earlier priorities entirely, provided the reader with a much better sense of what the department was trying to achieve, and provided much clearer linkages to the Government of Canada priorities (see table below). Moreover, given that the RPP for 2004-05 was produced using a different structure from the one used in this report, a crosswalk is included in Annex #1 to show linkages between the 2004-05 key commitments to the department's four program activities.

Strategic Outcome: ***Canadians derive sustainable social and economic benefits from the assessment, development and use of energy, forest and mineral resources, and have the knowledge to mitigate environmental impacts and respond effectively to natural and man-made hazards***

Departmental Priorities	Type	Government Priority	Main Estimates	Actual Spending
Knowledge, Innovation and Productivity	ongoing	Sustainable Economy	174.6	178.9
Trade and Investment	ongoing	Sustainable Economy	37.5	31.6
Energy and the Environment	ongoing	Sustainable Economy	385.2	360.8
Northern and Aboriginal Communities	ongoing	Aboriginal Peoples; Social Foundations	60.2	50.6
Public Safety and Security	ongoing	Canada's Place in the World; Social Foundations	18.8	16.3
Total - ($M)			**676.3**	**638.2**

Departmental Performance

Canada's enviable endowment of resources has historically been an important driver of development and is the foundation of one of Canada's most modern and competitive sectors today. The energy, forest, and mining industries are highly productive and innovative international players in the global market for natural resource products, and Canada's world-class geomatics and geoscience industry continues to support these sectors and many others in the

economy. One million Canadians have high-paying jobs in the natural resource sectors, which are the lifeblood of hundreds of communities across the country, especially in rural, remote, and Northern regions. The sustainable development and sound management of Canada's natural resources are fundamental to the country's socio-economic well-being and a healthy environment.

Over the past year, Canada's natural resource industries continued to benefit from strong global demand for resources, which have been supporting high commodity prices. Exports to developing economies have been a key source of this increased demand, although the gap between U.S. domestic energy production and consumption continues to support a healthy demand for Canada's oil and natural gas. After declining over the 2000 to 2003 period, total Canadian exports grew by 7.2 percent in 2004, with natural resource products leading the way, for example crude petroleum exports increased by 23.6 percent, those of lumber and sawmill products by 24.6 percent, and metal and metal ore exports by 27.1 percent. Growth in overall natural resource output has also been positive, and investment – both from within Canada and from abroad – has experienced strong growth, driven in part by higher-than-average corporate profits.

The paragraphs below explain and provide detailed information on each priority identified in the summary table, and explain how these priorities contributed towards achieving the department's strategic outcome. Section II of this report provides performance information on how the department delivered on its departmental priorities.

Knowledge, Innovation and Productivity targets the long-term competitiveness of the resource sectors in Canada. NRCan worked with its partners in each of the energy, forestry, minerals and metals, and earth sciences sectors to develop visions for innovation and appropriate science and technology (S&T) strategies to realize these visions. Such work has already been launched in the forestry sector through federal-provincial-industry cooperation on the Canada Forestry Innovation Council. The department's objective is to extend this concept to promote governance mechanisms that ensure the responsiveness of government science programs to identified needs.

Trade and Investment focusses on the long-term economic health of the resource sectors in Canada. Much of this depends on framework policies – taxation, competition, financial markets – and royalties. As the resource sectors continue to restructure on a global basis, Canada wants to ensure it is a competitive location for attracting global investment and talent and for hosting global resource companies' operations and headquarters. Our competition policies, championing Canadian investment abroad, and our financial markets are important in this area.

We moved forward with international strategies for each of the resource sectors. The strategies address market access and investment issues, trade and investment missions, and consistency in regulatory regimes. Canada has much to offer the world, and our "brand name" must be synonymous with innovation and quality.

Energy and the Environment are important areas of activity for NRCan. In particular, climate change poses a major, long-term challenge to global sustainability. In Canada, over 85 percent of our greenhouse gas (GHG) emissions are due to energy production or use, and we have one of the most energy-intensive economies in the world given our cold climate, long distances between population centres and energy-intensive industries.

The Kyoto agreement is key to drawing global attention to the need to start reducing emissions now. Federally, NRCan plays an important role in the development and delivery of policy and programs to encourage emissions reductions using existing, reliable technology in the areas of energy efficiency, alternative energy, and carbon sequestration.

In a longer term perspective, further emissions reductions will need to be achieved globally in order to minimize the risks of climate change. International investments in S&T are required to develop new technology that allows significant emissions reductions while sustaining economic growth. Given our vast reserves of fossil fuels, a key objective for Canada is the development of technology for cleaner fossil fuels production, conversion and combustion. Other federal priorities include advanced end-use efficiency, decentralized energy, renewable energy and the hydrogen economy.

International negotiations on the post 2012 climate regime are scheduled to start later in 2005. This provides an opportunity for Canada to influence the development of an international regime that would serve Canadian interests. Such a regime could combine shorter-term action against climate change with efforts to develop longer-term energy technology solutions. It will be important to engage all major GHG-emitting countries in a future regime, from both the industrialised and emerging economies.

In addition to mitigation strategies aimed at slowing climate change, policies and programs to support adaptation efforts are essential to address unavoidable climate change impacts. Such impacts and risks include: melting permafrost, sea ice and glaciers; prairie drought; rising sea levels and lower lake levels; forest fires and pests; and threats to national infrastructure, community water supplies and human health. NRCan will continue to advance our knowledge of the magnitude, rate and regional distribution of climate change and its impacts on Canada, while strengthening our capacity to estimate and adapt to the risks of climate change. Adaptation will involve planning, decisions and actions to manage risks so that Canadians are better positioned to take advantage of opportunities presented by climate change and to reduce any negative impacts.

The resource sectors are major employers across the country but especially in **Northern and Aboriginal Communities** where they provide crucial social and economic opportunities for Canadians. NRCan contributes to government initiatives that promote development opportunities in these communities through our work in support of the Canada Aboriginal Peoples Roundtable and the Northern Strategy. The department continues to work at increasing benefits from the resource-based economy, and works with partners to facilitate increased Aboriginal employment with new petroleum and mining activities, especially in the North and the northern parts of the western provinces. NRCan also improves the business and investment climate by seeking legal

and administrative certainty over lands and resources, and increase capacity for sustainable development with a focus on resource management and land use planning.

Public Safety and Security issues cut horizontally across all NRCan programs, with all sectors making noteworthy contributions from an all hazards approach. Ongoing S&T activities address a broad range of natural hazards, including impacts of forest fires, earthquakes, tsunamis, subsidence, flooding, geomagnetic storms, volcanic eruptions, and invasive insect species. These programs are supported by related science activities including emergency mapping and airborne radiation monitoring. In the post 9/11 security environment, significant departmental investment in terrorism-related activities has included various aspects of critical infrastructure protection, and explosives research and regulation. As a leader in the federal S&T community, NRCan demonstrates strong policy engagement with other stakeholders in such horizontal initiatives as the Public Security Technical Program and the Chemical Biological Radiological Nuclear Research and Technology Initiative.

In the April 2005 report entitled "Natural Resources Canada -- Governance and Strategic Management", the Auditor General addressed the department's emergency preparedness and risk management responsibilities and made recommendations for improvement in these areas. NRCan will examine the recommendations carefully with a view to developing an action plan to address the report's findings.

In addition to the departmental priorities above, this document provides performance information on **Corporate Management Issues** (Section IV). The department intends to build on the findings of the Auditor General's April 2005 audit of governance and strategic management, and the Treasury Board Secretariat's 2005 Management Accountability Framework assessment to strengthen its performance in areas of strategic planning, human resources management, real property management and strategy, and science management.

Performance Summary by Departmental Priority

Key Commitments/Performance Rating
★★★ Expectations Exceeded
★★ Expectations Met
★ Expectations Not Yet Fully Met

Rating	Program Activity	Key Programs/Services	Pages
Knowledge, Innovation and Productivity			
★★	Earth Sciences	Gas hydrates - Fuel of the Future	13 & vi
★★	Earth Sciences	Geoscience for Oceans Management	13 & vii
★★★	Earth Sciences	GeoConnections	13 & vii
★★	Earth Sciences	Canada Lands Survey System	15 & vii
★★	Energy	Energy policy development and analysis	16 & xi
★★	Energy	Electricity resources policy	17 & xi
★★	Energy	Petroleum resources policy	17 & xii
★★	Energy	S&T - Built environment	18 & xii
★★	Energy	S&T - Power generation	18 & xii
★★	Energy	S&T - Transportation	18 & xiii
★★	Energy	S&T - Conventional oil and gas	18 & xiii
★★	Energy	S&T - Unconventional oil and gas	18 & xiii
★	Energy	S&T - Industrial Sector	18 & xiv
★★	Forest	Sustainable forest policy and stakeholder relations	26 & xix
★★	Forest	Forest fire and management practices	27 & xix
★★	Forest	Native insects and diseases	26 & xx
★★	Forest	Alien invasive species	26 & xx
★★	Forest	Pest management	26 & xx
★★	Forest	Forest information synthesis and management	27 & xxi
★★	Forest	Forest biotechnology	27 & xxi
★★	Forest	Forest productivity	27 & xx
★★	Minerals & Metals	Mining, processing and environmental research	31 & xxiv
★★	Minerals & Metals	Advanced materials technology development	31 & xxv
Trade and Investment			
★★	Forest	International forest leadership and protocols	27 & xxi

Key Commitments/Performance Rating ★★★ Expectations Exceeded ★★ Expectations Met ★ Expectations Not Yet Fully Met			
Rating	Program Activity	Key Programs/Services	Pages
★★	Forest	Competitiveness of Canada's forest sector	27 & xxi
★★	Minerals & Metals	Economic and regional analysis	33 & xxvi
★★	Minerals & Metals	Tax and exploration	33 & xxvi
★★	Minerals & Metals	International liaison and trade relations	34 & xxvi
★★	Minerals & Metals	Industry and commodity market analysis	35 & xxvii
★★	Minerals & Metals	Business development	35 & xxvii
Energy and the Environment			
★★	Earth Sciences	Groundwater	14 & viii
★★	Earth Sciences	Reducing Canada's vulnerability to climate change	14 & viii
★★	Earth Sciences	Metals in the environment	15 & viii
★★	Earth Sciences	Legislated environmental and resource assessments	15 & viii
★★	Earth Sciences	Climate change impacts and adaptation	14 & ix
★★★	Energy	Opportunities envelope	19 & xiv
★★	Energy	Renewable energy programs	21 & xiv
★★	Energy	$C0_2$ capture and storage	22 & xv
★★★	Energy	Housing	19 & xv
★★	Energy	Buildings	20 & xv
★★	Energy	Equipment	20 & xvi
★★	Energy	House in Order / Government operations	xvi
★★	Energy	Industry	20 & xvi
★★	Energy	Transportation	20 & xvii
★★	Energy	Outreach	20 & xvii
★	Energy	Large final emitters GHG reduction	22 & xviii
★★	Energy	Low-level radioactive waste management (including Port Hope)	xviii
★★	Forest	Forest carbon modelling	28 & xxi
★★	Forest	Impacts and adaptation	28 & xxii
★★	Forest	Forestry practices	28 & xxii

Key Commitments/Performance Rating ★★★ Expectations Exceeded ★★ Expectations Met ★ Expectations Not Yet Fully Met			
Rating	Program Activity	Key Programs/Services	Pages
★★	Forest	Water/air quality	28 & xxii
★★	Forest	Biodiversity monitoring and conservation strategies	28 & xxii
★★	Minerals & Metals	Environmental assessments and regulatory processes	36 & xxviii
Northern and Aboriginal Communities			
★★	Earth Sciences	Aboriginal Property Rights Infrastructure	15 & ix
★★	Earth Sciences	Northern resources development	15 & ix
★★	Forest	Sustainable forest management and urban, regional and international partnerships	28 & xxiii
★★	Forest	First Nations/Aboriginal forestry capacity-building	28 & xxiii
★★	Minerals & Metals	Aboriginal affairs and sustainable communities	37 & xxviii
Public Safety and Security			
★	Earth Sciences	Natural hazards and emergency response	15 & x
★★★	Energy	Energy infrastructure protection	23 & xviii
★★	Minerals & Metals	Explosives regulations and permitting	37 & xxix
★★	Minerals & Metals	Explosives science and technology	38 & xxix

Corporate Management Issues			
★★	Section III	Procurement and contracting	55
★	Section III	Service Improvement Initiative	56
★	Section IV	Advancing modern management	59
★★	Section IV	Shared services	60
★	Section IV	Human resources management	60
★	Section IV	Real property strategy	61
★★	Section IV	S&T coordination	61
★★	Section IV	NRCan-On-Line	62

Section II – Analysis of Performance

Strategic Outcome – ***Canadians derive sustainable social and economic benefits from the assessment, development and use of energy, forest and mineral resources, and have the knowledge to mitigate environmental impacts and respond effectively to natural and man-made hazards.***

Analysis by Program Activity, Departmental Priorities and Key Programs/Services

NRCan's strategic outcome is supported by the Earth Sciences, Energy, Forest, and Minerals and Metals program activities. Section II presents performance information by program activity against the departmental priorities identified in Section I. In turn, each program activity provides clear, concise and balanced information on results from its key programs/services related to achieving the current departmental priorities. **A full description of these key programs/services by program activity and priority can be found in Annex #3** (starting on page vi), which also contains information on expected results, performance indicators and performance rating against 2004-05 milestones/targets; it also includes financial information for the other programs/services under these same program activities.

Program Activity #1: Earth Sciences (includes the Earth Sciences - Geomatics Canada Revolving Fund)

Earth Sciences - ($M)	Main Estimates	Actual Spending
Key Programs/Services Related to Achieving Departmental Priorities		
• Knowledge, Innovation and Productivity	28.9	26.4
• Energy and the Environment	13.2	20.5
• Northern and Aboriginal Communities	46.2	34.5
• Public Safety and Security	13.1	11.7
Sub-Total – Key Programs/Services	101.4	93.1
Sub-Total – Other Programs/Services	85.6	92.1
Sub-Total – Program	**187.0**	**185.2**
Corporate Management	35.8	41.5
Total - Program	**222.8**	**226.7**
FTEs	1,633	1,633

The **Earth Sciences** program activity is an essential component of the S&T Canadians need to make informed economic, social and environmental decisions. Geomatics Canada, Canada's national mapping agency, provides geographic information of Canada's landmass and offshore including topographic maps and aeronautical charts, legal surveys of Canada Lands, geodesy for accurate positioning, and the archiving and application of earth observation data. The Geological Survey of Canada, Canada's national geoscience agency, works with the provinces and territories to provide the geological information that ensures a competitive investment climate for mineral and petroleum exploration, elucidates groundwater resources, maps the geology of the seafloor, helps reduce the risk posed by natural hazards such as earthquakes, magnetic storms, landslides, and naturally-occurring toxic substances. Earth Sciences also manages horizontal programs in Climate Change Impacts and Adaptation, and GeoConnections, delivers Canada's commitment to monitoring nuclear explosions under the Comprehensive Test Ban Treaty, responds to nuclear emergencies, and provides logistics support to Arctic science through the Polar Continental Shelf Project.

Performance Assessment Against Departmental Priorities [1]

The Earth Sciences program activity contributed to the departmental priority **Knowledge, Innovation and Productivity** through, for instance, its work on gas hydrates which provides the geoscience products and engineering activities that will help to transform gas hydrates into a potentially commercially viable and environmentally friendly natural gas supply. Gas hydrates program stakeholders have begun public and corporate actions that recognize gas hydrates as a future part of the fuel supply, as illustrated by the APEC Energy Security Initiative (Santiago Declaration), announced by Prime Minister Paul Martin in November 2004.

Canada is committed to developing detailed seabed maps of the bathymetry and surficial geology of its continental shelf to help manage and conserve its resources. In partnership with the Department of Fisheries and Oceans (DFO) and the local scallop fishing industry, the Oceans Management Program recently mapped scallop grounds off southwest Nova Scotia. The scallop industry uses bottom habitat maps to cut costs and boost catches by concentrating on areas identified as scallop habitats. As well, the maps allow fishers to avoid rugged terrain ill suited to towing fishing gear.

Work on GeoConnections continued in 2004-05. GeoConnections is a major national partnership initiative created to build the Canadian Geospatial Data Infrastructure (CGDI) and make Canada's location-based data, applications, and services readily accessible on-line to support a wide range of key public priorities. Fiscal year 2004-05 represented the last year of the initial funding for GeoConnections. Phase II of this initiative is beginning in 2005-06. Since its

[1] A full description of the key programs/services – by program activity and departmental priority – can be found in Annex #3. This annex also contains information on expected results, performance indicators, and performance rating against 2004-05 milestones/targets; it also includes financial information for other programs/services under these program activities.

inception in 1999, this initiative has built the foundation of policies, standards, protocols, technologies, and partnerships required for Canadians to benefit from easy on-line access to geographic data, services, and applications. All levels of government, the private sector, academia, and non-government organizations have worked together to build the CGDI and, in turn, contribute to the Canadian economy, society, and environment. For example, GeoConnections' leadership helped governments across Canada to integrate their geomatics activities by encouraging them to work together and by developing policies and standards for efficiently sharing and using data. GeoConnections also contributed to Canada by helping build geomatics capacity in rural, coastal, Aboriginal, and northern communities. These communities can now use geomatics to support socio-economic growth and make informed decisions about sustainable development. Consequently, Canadians are much better equipped to plan their communities, manage natural resources, protect the environment, and safeguard their health.

Glaciology research scientists from the Geological Survey of Canada are cutting samples from the Mount Logan core in the cold room lab in Ottawa.

Energy and the environment – A clean and healthy environment is essential to a good quality of life and is a priority for NRCan. The Earth Sciences program ensures that Canadians can enjoy the sustainable and beneficial use of our country's land and resources, now and in the future. It has undertaken ambitious projects that involve studying and mapping major Canadian aquifers, providing information to better assess climate change and its effects, and examining how metals enter the ecosystem with a view to prevention and risk assessment. The program also lends its geoscience expertise where new land-use designations are being considered.

Available groundwater data and information in provinces and territories are accessible through the program's groundwater database. Departmental groundwater scientists provided advice to the Ontario Minister of the Environment in their Source Water Protection Strategy. Also, a number of municipalities utilize NRCan's results of aquifer assessments to design their land-use and aquifer protection plans. In 2004-05, the Climate Change Impacts and Adaptation Program funded 32 new research projects across Canada. These projects dealt with a variety of issues including water resources, fisheries, agriculture, non-commercial food supplies, and human health. For instance, researchers investigated the vulnerability of groundwater supplies in Prince Edward Island, studied the impacts of climate change on Arctic Char in the North, examined strategies to deal with drought in the Prairies, and assessed the role that local ecological knowledge can play in adapting to changing food supplies in northern British Columbia.

Similarly, the Reducing Canada's Vulnerability to Climate Change Program improves the scientific understanding of past, present, and future climate variability and changes on Canada's landmass. NRCan has been accepted as the lead source for provision of data on land use change

and greenhouse gas (GHG) fluxes over Canada's arctic and subarctic landmass for the United Nations Convention Framework for Climate Change reporting and post-Kyoto negotiations.

The Metals in the Environment (MITE) program is working with Health Canada (HC) to ensure that Canadians avoid unsafe levels of metals. By establishing baseline concentrations at contaminated land sites across Canada, MITE researchers can quickly flag areas whose geochemical levels exceed acceptable standards. HC can then take steps to reduce the risks associated with these metals.

The Earth Sciences program also provides expert technical advice to meet the federal government's obligations under the *Canadian Environmental Assessment Act*. Its geoscientists reviewed more than 50 development projects in 2004-05, including those involving mines, hydro and nuclear energy developments, recreational facilities, and urban and industrial waste disposal plants.

Moreover, the Earth Sciences program addresses **Northern and Aboriginal Communities** issues through, for instance, the Geomatics for Aboriginal Property Rights Infrastructure Program which provides fundamental governance support to the First Nations' devolution process and contributes to the economic and social success of Aboriginal people. For example, the Capacity Building – Cadastral Reform Project is a joint venture with Indian and Northern Affairs Canada (INAC) to integrate the Canada Lands Surveys Records with the Indian Land Registry. This project will increase integrity in the land tenure system on First Nation's reserves, reduce liability to the Crown, support the First Nations Lands Management Initiative and other self-government initiatives, and encourage more informed decision making by improving access to data at all levels of government. Recognizing the importance of this undertaking, both NRCan and INAC have added resources and moved milestones to complete the project ahead of schedule.

Public Safety and Security is another issue addressed through the Earth Sciences programs and services. Even though the program met or exceeded all of NRCan's legislative obligations with respect to emergency preparedness and response, the Natural Hazards and Emergency Response Program (NHERP) was originally expected to accomplish more, specifically in terms of increasing the scope and understanding of integrated hazard assessment and risk management. The NHERP's design was incomplete and not adequately communicated so that the logic behind achieving the outcomes was called into question. It was determined that the NHERP was overly ambitious relative to the assigned resources. For 2005-06, the Program will be replaced with new sub-sub activities with an improved design, clearer roles, and more realistic and contemporary objectives. The new activities will provide a service to Government to disseminate hazard information, and a research program designed to reduce risk from natural and human-induced hazards.

Program Activity #2: Energy

Energy - ($M)	Main Estimates	Actual Spending
Key Programs/Services Related to Achieving Departmental Priorities		
• Knowledge, Innovation and Productivity	60.7	89.1
• Energy and the Environment	350.4	325.8
• Public Safety and Security	0.4	0.6
Sub-Total – Key Programs/Services	411.5	415.5
Sub-Total – Other Programs/Services	192.4	400.2
Sub-Total – Program	**603.9**	**815.7**
Corporate Management	30.2	34.9
Total - Program	**634.1**	**850.6**
FTEs	1,145	1,145

The **Energy** program activity fosters the sustainable development and responsible use of Canada's energy resources to meet the present and future needs of Canadians. It focuses on S&T, policies, programs, knowledge and international activities in the areas of energy efficiency (residential, commercial, industrial, transportation), renewable energy, electricity, nuclear energy, alternative transportation fuels, and the production of conventional and unconventional fossil fuels to further sustainable development. Through its work, the program/activity helps address the climate change challenge; promotes better environmental and consumer choices; works with key industry sectors to establish reduction targets for greenhouse gas emissions; facilitates North American and international trade in energy; contributes to technical innovation, job creation and economic growth; facilitates environmental protection and increased public safety and security; and helps to ensure competitively priced, reliable and secure energy supplies for Canadians.

Performance Assessment Against Departmental Priorities [1]

In 2004-05, the Energy program activity contributed to the **Knowledge, Innovation and Productivity** priority through its work on energy policy development and analysis, which ensures that Canada's energy policy framework is continuously refined to ensure a secure, reliable energy supply. The energy policy framework also addresses environmental, climate change and security imperatives and pursues new opportunities which will bring social and economic benefits to Canadians.

[1] A full description of the key programs/services – by program activity and departmental priority – can be found in Annex #3. This annex also contains information on expected results, performance indicators, and performance rating on 2004-05 milestones/targets; it also includes financial information for other programs/services under these program activities.

Several noteworthy events were initiated or undertaken to support Canada's energy policy framework during the period under review. For example, the Canadian Council of Energy Ministers endorsed continuation of the Industry Dialogue process to advance common energy priorities; discussions with the industry and provinces have been encouraging, with a consensus building on a core of work to inform the refinement of Canada's energy policy framework. In addition, Budget 2005 announced $200 million to support development and implementation of the Sustainable Energy Science and Technology Strategy. The National Advisory Panel on Sustainable Energy Science and Technology Strategy was created to provide advice to the Minister of NRCan. The strategy will identify priorities and specific actions to be taken that respond to Canadian circumstances and capitalize on emerging opportunities to make the necessary S&T advancements to transform our energy economy.

Also during 2004-05, the Minister of NRCan held two meetings of the Atlantic Energy Roundtable (AER). The AER was convened to provide a forum for governments, offshore operators, supply and service companies, regulators and labor to work together on issues of common interest to the further development of the Atlantic offshore oil and gas industry. Extensive work has begun on developing effective, transparent and efficient regulatory systems consistent with those in other similar jurisdictions. Moreover, consultations took place during the year on whether to lift the moratorium on exploration offshore B.C. Three reports were prepared and submitted to the Minister for the government’s consideration.

Energy is a major pillar of the Canadian economy, representing 5.6 percent of our GDP and nearly $60 billion in exports in 2003. The energy sector provides over 225,000 well-paying skilled jobs, and over the past few years, between $10-14 billion/year in payments from oil and gas revenues alone have been paid to governments to fund priority expenditures. These figures are a strong indication of solid performance in the energy sector, and suggest that Canada's energy policy framework is sound and appropriate. Our energy framework will necessarily continue to evolve and be refined on an ongoing basis to deliver on our prosperity, security and environmental sustainability objectives.

On the energy S&T side, in which the development of new knowledge and technologies is an overarching theme pertinent to of all NRCan's priorities, the programs, at the aggregate level, generally met expectations for the year and there were no serious shortfalls. However, by virtue of the inherently uncertain nature of S&T in which progress towards outcomes cannot be held to a rigid timetable, individual project level expectations were not fully met in some areas, or fully met or exceeded in others. On balance, satisfactory progress was made. As part of results-based management, all NRCan energy S&T activities must incorporate a risk management strategy to help identify areas needing corrective actions. As part of the normal management process, corrective actions were taken to address areas that fell short of expectations, or when it became obvious that a technology or process was unlikely to lead to a useful result. Corrective actions ranged from redirection of funding or a change in the approach to R&D activities to the outright termination of projects.

The following are key achievements in 2004-05 under this priority:

- the development of a revised Community Energy Plan (CEP) Guide which includes detailed instructions on developing a CEP and will be of substantial value to communities across Canada – currently over 200 – that have adopted the concept of holistic, integrated energy planning; the new guide includes energy-related performance indicators for community energy planning, a significant enhancement to improve communities' ability to monitor progress and direct their future action;
- a 5 kilowatt fuel cell was installed and commissioned at the Canadian Centre for Housing Technology; this was the first installation of a fuel cell in a house in Canada; it will provide essential information on how natural gas can be used to satisfy the electrical and thermal loads of a typical Canadian R-2000 home in response to real weather and standard occupancy demand profiles; and
- the final stage of a Clean Coal Technology Roadmap was drafted which identifies technologies and energy system pathways for power plant retrofits and mid-term new construction, as well as technologies for the 2020 time frame, to allow coal to be used as a competitive, environmentally clean energy resource for the production of electricity; see http://www.nrcan.gc.ca/es/etb/cetc/combustion/cctrm/htmldocs/overview_e.html; similarly, a CO_2 Capture and Storage Roadmap identifies technologies, strategies, processes and integration system pathways needed to allow CO_2 to be captured from large point sources and stored underground in geological formations; see http://www.nrcan.gc.ca/es/etb/cetc/combustion/co2trm/htmldocs/mission_e.html.

More information on NRCan's energy S&T can be found at http://www.nrcan.gc.ca/dmo/scitech/entech_links.htm.

Canada signed the international Generation IV Framework Agreement in February 2005, to maintain and enhance Canadian capability in nuclear energy R&D. It enables multi-lateral R&D to develop the fourth generation of nuclear reactor designs (for deployment beyond 2025) that address the challenges facing nuclear technologies today. Canada is one of the founding members of the Generation IV International Forum (GIF) and has played a prominent role in GIF from the very beginning in developing the policy, legal and R&D framework, and providing technical expertise and leadership. The main goal during 2005-06 will be to establish the Canadian program.

The Energy program spent $325.8 million (or 22 percent of total departmental authorities) on activities related to the **Energy and the Environment** priority. Almost all of the investments under this priority was directed to addressing climate change, a major global challenge. With the ratification of the Kyoto Protocol in December 2002, the Government of Canada committed to see Canada contribute to international efforts to reduce greenhouse gas emissions (GHG). Given that most GHG emissions in Canada are due to energy production and consumption, a major thrust of the federal climate change strategy pertains to efforts to reduce emissions from energy.

The year 2004-05 was significant on the international policy stage with the Kyoto Protocol coming into force on February 16, 2005. The Government of Canada also announced that it will host the United Nations Framework Climate Change Conference - Montreal 2005 from November 28 to December 9, 2005. This is a major meeting for the international climate change negotiations as the Eleventh Conference of Parties to the United Nations Framework Convention on Climate Change (COP11) and First Meeting of the Parties to the Kyoto Protocol (COP/MOP1). On the domestic policy front, 2004-05 was also significant as it marked a major step up of efforts to reduce GHG emissions in Canada. Indeed, it was the first complete year of activity for the new programs that were announced on August 12, 2003, from $1 billion of funding from Budget 2003. A major portion of these programs are managed or co-managed by NRCan, leading to a marked increase in departmental spending in this regard in 2004-05.

One of the key programs introduced from Budget 2003 funding is the Opportunities Envelope, which provides financial contributions to initiatives proposed by the provinces and territories that will results in cost-effective GHG emissions reductions within their jurisdictions. While spending was limited during 2004-05, significant success was achieved with the development of 29 joint federal/provincial/territorial initiatives that will represent an investment of up to $53 million under the Opportunities Envelope in coming years. The department also supported efforts to develop Memoranda of Understanding with interested provinces and territories.

Significant achievements were realized to increase energy efficiency and the use of alternative energy sources in 2004-05. With respect to energy-efficient housing, NRCan exceeded expectations in promoting more energy efficient housing. It is working to ensure that all new houses are built to a higher standard by 2010 and is accelerating demand for energy efficiency retrofits of existing houses under the EnerGuide for Houses (EGH) initiative. The target for EGH evaluations has been exceeded with over 76,000 evaluations in 2004-05. Also, average GHG/house reductions are higher than planned. NRCan launched the EnerGuide for Houses Retrofit Incentive (EGHRI) in October 2003. The EGHRI complements the original EGH initiative by providing performance-based grants based on EGH ratings. Houses qualifying for a grant (averaging $650) saved approximately 27 percent on energy bills and reduced GHG emissions by an average of 4 tonnes per house each year. Almost 23,000 homeowners have received incentives to date (as of June 1, 2005), totalling $15 million dollars. Budget 2005 recognized the success of NRCan's housing initiatives by allocating $225 million over the next five years to quadruple the number of homes retrofitted under the EGHRI. This new federal level of effort will support energy efficiency improvements in a total of 500,000 homes by 2010.

With respect to commercial and institutional buildings, NRCan is meeting its commitment to promote energy efficient buildings to achieve, on average, 20 percent energy savings in the retrofitted floor space of recipients of financial assistance and to improve the energy efficiency of new commercial, institutional, industrial and multi-unit residential buildings. Under the Commercial Building Incentive Program (CBIP), NRCan provides financial incentives to eligible building owners to construct new commercial, institutional, and multi-unit residential buildings that are at least 25 percent more energy-efficient than similar buildings constructed to the Model National Energy Code for Buildings (MNECB). On average, CBIP buildings are about 35 percent more energy-efficient than the level required by the MNECB. Under the Energy Innovators Initiative, over 2000 organizations representing about 30 percent of the floor space in the commercial and institutional sector have been recruited as innovators. Projects receiving financial incentives averaged 20 percent energy savings per project.

Through its equipment programs, NRCan sets energy efficiency standards and regulations and encourages the purchase of highly efficient products. The *Energy Efficiency Regulations* cover products that consume 80 percent of the energy used in the residential sector and 50 percent in the commercial and institutional sector. Canada's energy efficiency regulations are the most stringent in the world. To influence the manufacture and availability of more efficient products, Canada adopted the internationally recognized ENERGY STAR® symbol for a number of product categories in the residential, commercial and industrial sectors. The symbol allows the consumer to easily identify the most energy-efficient products available.

NRCan's Canadian Industry Program for Energy Conservation (CIPEC), at the sector-level, and the Industrial Energy Innovators Initiative, at the company-level, address barriers to planning, implementing and tracking energy efficiency projects in industry and encourage energy efficiency investments to improve competitiveness and contribute to Canada's climate change goals.

NRCan delivers initiatives to reduce transportation-related GHG emissions by increasing the fuel efficiency of motor vehicles and encouraging the use of alternative fuels. Significant efforts in 2004-05 were directed towards the negotiations on fuel efficiency with the auto sector. On April 5, 2005, the Government of Canada and the Canadian auto industry signed a voluntary agreement to reduce GHG emissions from cars and light trucks by 5.3 Mt per year by 2010. As well, through the Ethanol Expansion Program (EEP), NRCan is meeting its key commitment to increase current fuel ethanol production and use in Canada to reduce transportation-related GHG emissions. The EEP was announced from Budget 2003 with a $100 million budget for contributing to the expansion of fuel ethanol production and use in Canada. Round one of the Ethanol Expansion Program committed $72 million to six ethanol plant projects in Canada totaling 650 million litres per year; this is almost one half of the 1.4 billion litres target and will more than quadruple the country's renewable fuel production. Three of these projects have already started plant construction, the other three plan to do so during the summer 2005. Total investments in these projects total almost half a billion dollars. Request for proposals under round two of the EEP was issued in December 2004.

NRCan provides Canadians with information on reducing energy use and directs them to programs that can help them improve energy efficiency in their transportation and home energy choices. Distribution of OEE publications increased by more than 300 percent in 2004, to more than 2.5 million. The One-Tonne Challenge (OTC) initiative, co-led by NRCan and Environment Canada, was launched in March 2004. It is a call on all Canadians to reduce their GHG emissions by one tonne or about 20 percent. Through this program, more than 900,000 OTC Tips Guides have been distributed and 30,000 pledged on-line to take the challenge.

With respect to emerging renewable energy, the number of financial contributions provided to support the use of solar and biomass heating systems under the Renewable Energy Deployment Initiative continued to increase in 2004-05; 262 solar and biomass systems were installed in Canada. The department also supported the deployment of ground source heat pumps (GSHP) through the Canadian Geoexchange Coalition, which is composed of a number of Canadian utilities. This coalition encountered a number of difficulties during the year and the expected number of GSHP installations were not achieved. By the end of the year, the coalition had reorganized and appears to be on track to meet its objectives.

Success was also achieved under the Wind Power Production Incentive (WPPI) as a major portion of the program funding was engaged by the end of the fiscal year. The program delivered a better than expected performance and the total installed wind power capacity in Canada was 444 MW by the end of 2004. Budget 2005 recognized the success of NRCan's emerging renewable energy programs by proposing to quadruple the aim of the WPPI to a target of 4,000 megawatts of new wind power capacity, and by announcing the introduction of a new incentive for other emerging renewable electricity sources. In May 2005, the Cabinet approved the expansion and extension of WPPI. Also related to wind and its use as an important renewable energy source, the Wind Energy Atlas was publicly unveiled in October 2004. It pinpoints the best locations in Canada to take advantage of wind and will help to reduce costs and the time it takes to develop a site. The atlas was created with a database, the Wind Energy Simulation Toolkit, as part of a federally-funded R&D project. Work was conducted in partnership between experts at Environment Canada and the National Research Council.

Under the Market Incentive Program, a second Invitation to Proponents was finalized and six new contribution agreements signed. New green power programs have been undertaken in Ontario, Alberta and Saskatchewan. The federal purchases of electricity from renewable resources more than doubled its purchases and is now one third of the way to the annual target of 450 GWh which represents 20 percent of electricity from emerging renewable sources by 2010. All renewable energy related climate change programs are currently under review. This two-stage review will ensure that programs that are not achieving the anticipated results will be readjusted, redirected or terminated, as appropriate. Resources will be reallocated among existing and new programs.

The four-year, $42 million Phase 1 of the International Energy Agency Weyburn CO_2 Monitoring and Storage Project in Saskatchewan to assess the technical and economic feasibility of carbon dioxide storage in geological formations was successfully concluded in 2004, following an

investment of $6 million by NRCan. Performance assessment studies indicate that the geological setting at the Weyburn field is very suitable for long-term subsurface storage of carbon dioxide (CO_2). NRCan will participate in Phase 2, and has committed $6.75 million to it. Phase 2 will focus on additional studies leading to the development of a best practices Design and Operating Manual for site assessment, project design, and field implementation of commercial CO_2 geological storage projects. Knowledge acquired from monitoring and operating demonstration projects, as well as the Weyburn project, will lead to technologies and protocols in support of the best practices manual.

A key achievement in 2004-05 under the Carbon Dioxide Capture and Storage Incentive Program was the commencement of four demonstration projects using carbon dioxide CO_2 to improve hydrocarbon recovery while at the same time, permanently storing CO_2 in the geologic formations. It is anticipated that these demonstration projects may lead to full scale commercial projects capable of storing significant quantities of CO_2 in the years to come.

Although NRCan continued extensive discussions with key stakeholders under the Large Final Emitters initiative, released eleven discussion papers on a proposed framework, and completed an MOU with the steel industry, expectations were not fully met under this program. The government's revised climate change plan for honoring its Kyoto commitment – which was released shortly after the end of 2004-05 – identifies the *Canadian Environmental Protection Act 1999* as the preferred legislative option to implement the large final emitters system. As a consequence, responsibility for this initiative has been transferred to the Minister of the Environment. The policy and target analysis developed to date by NRCan will form a substantive contribution to the completion of the legislative package by Environment Canada.

While a major focus of departmental activities are with regard to achieving emissions reduction by the Kyoto commitment period of 2008 to 2012, the department is also engaged in a significant manner in the development of longer term, energy technology-based solutions to climate change. Budget 2003 announced new funding for technology and innovation. The Technology and Innovation Research and Development Initiative addresses five strategic priorities: cleaner fossil fuels; advanced end-use efficiency; decentralized energy production; biotechnology; and the hydrogen economy. The energy S&T activities described under the previous Knowledge, Innovation and Productivity priority also contributed to the development of new climate change-friendly energy technologies.

A significant achievement in 2004-05 was the establishment in Ramea, Newfoundland, of a 390 kW wind-diesel demonstration project. It uses a unique control system to combine wind and diesel power that was developed, with NRCan support, at the Atlantic Wind Test Site in P.E.I. This is an important demonstration of the technology, which has the potential for reducing GHG and other emissions in remote areas that are not connected to the electricity grid and are powered solely by diesel generators.

Building on decades of effort, the department continued to develop new technologies and innovations to ensure the continued sustainability of the rapidly expanding oil sands industry through energy efficiency improvements, reduced environmental footprint and decreasing GHG emissions. In 2004-05, working in partnership with existing operators and new entrants in the oil sands industry, NRCan demonstrated, at pilot scale, innovations on the recently developed paraffinic solvent-assisted bitumen extraction process, a rapid-settling technique involving CO_2 sequestration for tailings management, and improved energy efficiency in upgrading through process unit fouling mitigation and corrosion inhibition. These developments were either immediately commercially deployed or are further developed by external organizations with federal assistance from such agencies as Sustainable Development Technology Canada, Technology Partnerships Canada and the Industrial Research Assistance Program.

In addition to activities addressing climate change, NRCan is involved in air quality management. As co-chairs of the Council of Energy Ministers, NRCan and New Brunswick have ensured that the energy sector is represented on the newly-formed federal-provincial-territorial Air Management Committee (AMC). NRCan has subsequently assumed the coordinating role in the development of federal, provincial and territorial energy input to AMC's deliberations as well as providing a single point of contact between jurisdictions and the committee. The department has also provided extensive input into modeling efforts aimed at exploring the possibility of cross-border emission trading for sulphur dioxide (SO_2) and nitrous oxide (NOx) and is now participating in consultations with provinces and territories.

The Energy program pursued the **Public Safety and Security** priority through ongoing restructuring of the power industry. The 2003 blackout led governments and the bulk power industry in Canada and the United States to prepare for the implementation of mandatory and enforceable reliability standards. These developments will result in new institutional arrangements for the management of electricity reliability. The appropriate role for NRcan in supporting provinces in the event of a significant power outage will be reassessed in this context.

During 2004-05, there were significant achievements in addressing not only the direct causes of the 2003 blackout, but also institutional issues concerning reliability management and the physical and cyber security of bulk power systems. In particular:

- the Canada-U.S. Power System Outage Task Force, co-chaired by the Minister of NRCan and the U.S. Secretary of Energy, issued its report on the causes of the outage and a comprehensive set of recommendations;
- Canada and the U.S. extended the mandate of the task force to oversee implementation of the recommendations, and substantial progress has been made. A progress report was issued by the task force in August 2004; and

- Canada's Council of Energy Ministers endorsed the recommendations and established a senior level federal-provincial-territorial working group to work with their U.S. counterparts to prepare for the implementation of mandatory and enforceable reliability standards in the U.S. and in the provinces of Canada; NRCan is an active participant, along with provincial energy departments in this working group, and in the bilateral working group established with the U.S. Department of Energy and Federal Energy Regulatory Commission.

The Energy program has a mandate to enhance the protection of critical energy infrastructure through working with key stakeholders domestically and internationally. A number of initiatives in this regard are ongoing in partnership with the provinces and territories, the energy industry, energy regulators, and with the U.S. Government to ensure that critical energy infrastructure, including cross-border facilities are protected from natural hazards and malicious acts such as terrorism.

NRCan is working with the U.S. pursuant to the Smart Border Declaration, to assess the vulnerability of shared energy infrastructure. In future, we will also work cooperatively with stakeholders on initiatives under the Security and Prosperity Partnership between Canada, the U.S. and Mexico, to meet our common goals of enhanced North American security, prosperity and quality of life. The Smart Boarder Declaration and Vulnerability Assessments are important to Canada since our interest lies in ensuring that energy security and the energy trade continues to contribute to the economy and job creation. Direct employment, excluding service stations and wholesale trade in petroleum products, was approximately 230,000 people in 2003. The U.S. is keen to ensure the integrity of the energy supply flow from Canada. In 2003, energy exports to the U.S. market totaled $57.9 billion.

NRCan is also contributing to the development of the National Critical Infrastructure Assurance Program in order to ensure that this program addresses the needs and concerns of the energy industry and provides a framework compatible with NRCan's policies and initiatives with respect to the protection of critical energy infrastructure. The department has developed a comprehensive emergency notification and response protocol to address any emergencies which may affect Canadian energy systems and facilities. The process worked well during the power outage of August 14, 2003 and the department will continue to refine it based on lessons learned.

Program Activity #3: Forest

Forest - ($M)	Main Estimates	Actual Spending
Key Programs/Services Related to Achieving Departmental Priorities		
• Knowledge, Innovation and Productivity	58.6	39.5
• Trade and Investment	32.9	28.0
• Energy and the Environment	20.9	13.8
• Northern and Aboriginal Communities	13.3	14.9
Sub-Total – Key Programs/Services	125.7	96.2
Sub-Total – Other Programs/Services	36.5	56.6
Sub-Total – Program	**162.2**	**152.8**
Corporate Management	13.2	15.3
Total - Program	**175.4**	**168.1**
FTEs	957	957

The **Forest** program activity promotes the sustainable development of Canada's forests for the social, environmental and economic well-being of present and future generations of Canadians. As the national forest policy coordination and S&T research agency in Canada, NRCan plays a pivotal role in leading change for a healthy forest and a strong forest products sector by: building consensus on key forest issues; shaping national and international forest policy agendas responding to forest-related international commitments and obligations; enhancing the competitiveness of Canada's forest sector; generating, assembling and disseminating forest S&T and policy information; and in developing, implementing and transferring sustainable forest management knowledge, products, strategies and technologies to Canadian forest managers and to nations around the world.

Performance Assessment Against Departmental Priorities [1]

In collaboration with partners and stakeholders, the Forest program activity pursued a wide range of activities aimed at improving the health and sustainablity of Canada's forests, the forest industry, and enhancing the economic capacity of Canada's First Nations peoples through their participation in sustainable forest management projects. The Forest program also played a stewardship role in advancing Canada's concept of sustainable forest management with the international community by developing and implementing programs and initiatives aimed at: sharing forest information and pursuing an accepted understanding of Canada's concept of

[1] A full description of the key programs/services – by program activity and departmental priority – can be found in Annex #3. This annex also contains information on expected results, performance indicators, and performance rating against 2004-05 milestones/targets; it also includes financial information for other programs/services under these program activities.

sustainability internationally; enhancing market access opportunities for Canada's forest products industry; and in preventing and/or mitigating trade barriers from being erected in traditional forest markets.

The Forest program pursued the department's **Knowledge, Innovation and Productivity** priority under the following key programs: sustainable forest policy and stakeholder relations, forest fire and management practices, native insects and diseases, and alien invasive species.

In terms of innovative partnerships and public participation, progress was made in the development of geographically-based clusters consisting of forest science research capabilities and expertise. This is a means to develop synergies among the three principle players in the national innovation system: governments, academia and industry. Tripartite funding support and commitments were established between the federal-provincial governments and the industry with a pilot cluster site established in the province of British Columbia (B.C.). There has also been considerable involvement in a biotechnology cluster in Northern Ontario.

Significant progress was made towards an innovation vision for the sector. In partnership with the Canadian Forest Innovation Council (CFIC), NRCan piloted an examination of the alignment of its research to the CFIC agreed priorities which are also aligned to the government's agenda. CFIC used this successful model to map the alignment of research done across Canada within the forest sector to its priorities. NRCan is also leading the creation of a virtual research centre focussed on enhanced value from fibre.

Working in partnership with federal departments, NRCan developed the forest sector element of the federal approach to implement the National Strategy for Alien Species. The strategy received funding in 2005 and NRCan will be allocating $10 million over the next five years to provide S&T knowledge and expertise in support of field operations conducted by partners as well as advice on policy and regulations.

The fifth *National Forest Strategy - A sustainable Forest: The Canadian Commitment (2003-2008)* is the overarching framework that helps to guide the Forest program business objectives and other federal priorities in the area of forestry policy, science and program initiatives across Canada and internationally. It was endorsed by the Canadian Council of Forest Ministers (CCFM) members and some 50 non-government organizations through the signing of the companion third *Canada Forest Accord*. The Program provided expertise to guide the general direction of the National Coalition, and its committees and thematic teams. It also strongly advocated membership involvement, and coordinated the preparation of a national accomplishments report based on the national strategy.

Wildland fires have increasingly become a threat to communities in Canada. A draft Canadian Wildland Fire Strategy to deal with the urban-wildland fire interface has been developed in conjunction with the provinces and territories for consideration by the CCFM at its upcoming meeting in the fall of 2005. As well, public consultations on the control of the mountain pine beetle infestation in B.C. have helped produce communications strategies for Canada's national parks and a best practices guide was developed for increased public participation in forest management.

In 2004-05, the Forest program activity developed the foundation for long term strategic research in the area of forest biotechnology – an area of research aimed at developing environmentally acceptable technologies to strengthen tree improvement rates, as well as the health and resistance of trees to insects and disease. As a result, the development of strategic priorities for research in genomics received Treasury Board approval for funding at $6 million for 2005-08.

A number of important milestones were also reached from a forest science perspective. Data and results from pre-commercial forest thinning trials were completed ahead of schedule for use by provincial forest managers in updating growth and yield models for improved forest management decision-making; long-term ecological impact studies were completed for Ontario and Quebec on the spruce budworm; information exchanges were conducted with American, European, and Asian forest professionals on native and invasive alien species and the use of environmentally safe biological methods in their control; improved estimates were obtained on the impact of defoliators on the growth of B.C. forests; and knowledge/information transfers took place with federal and provincial governments and industry regarding the impact of the black-headed budworm on coniferous forests.

The Forest program pursued NRCan's **Trade and Investment** priority by increasing emphasis on forest industry trade and competitiveness issues. The goal is to better understand Canada's forest sector and help position it to take advantage of a changing global environment. As well, the Program continued its effort to maintain and enhance market access and secure international arrangements to promote and safeguard Canadian forest interests and advance forest sector positions and commitments in international climate change negotiations and the Canadian Biodiversity Strategy.

Canada participated in G8 discussions on forestry issues and has worked toward strengthening the United Nations Forum on Forests (UNFF). NRCan continued to provide support to international forestry meetings and engaged in bilateral relationships with other countries such as Sweden, Finland, Japan, and Russia.

Canada's international climate change commitments remained a high priority agenda item. The development of Canada's National Forest Carbon Monitoring, Accounting and Reporting System (NFCMARS) proceeded as planned, including the release of the first version of the operational-scale Carbon Budget Model of the Canadian Forest Sector (CBM-CFS). NFCMARS supports compliance with the requirements to report forest carbon stock changes and GHG emissions under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto

Protocol. It also provides information and analysis needed for the critical decision to be made in 2006 regarding the inclusion of forest management within Canada's protocol accounting. Results of analysis will also be used in reporting forest-related information in: the 2006 UNFCCC GHG inventory; the Food and Agriculture Organization forest resource assessment; criteria and indicators reporting; and certification. A national implementation plan for deforestation monitoring was also delivered outlining time lines and activities required to meet Kyoto Protocol and UNFCCC deforestation-reporting commitments.

NRCan's Forest program activity further advanced the **Energy and the Environment** priority through its forest carbon modelling; impacts and adaptation; forestry practices; water/air quality; and biodiversity monitoring and conservation strategies programs and services.

Accurate monitoring and understanding of the forest carbon dynamics and of the impacts of climate change on the forest is essential to develop sound forest management practices and ensure the sustainability of the forest sector. Together with other carbon monitoring components of NFCMARS, the CBM-CFS provides a foundation upon which advanced work aimed at understanding the impact of climate change on forests is being carried out. Our ability to predict the impacts of climate change on forest, to develop scenarios, and to consider appropriate responses has increased significantly. For example, work has been conducted on the spread of the mountain pine beetle in B.C. and Alberta under various climate change scenarios. This knowledge is now being used for policy development and decision-making at all levels of government and within the industry.

The Forest program also continued its participation in the long-term monitoring effort of the Turkey Lakes Watershed through partnership with other departments. The effects of acid rain and other pollutants on the health of this ecosystem are being assessed and the knowledge gained is used to develop techniques and strategies, including influencing international policies that address the impacts of natural and human disturbances on the health of Canada's forests and the water source they supply.

The Forest program activity developed a forest-associated species database to allow for consistent reporting on the status of forest associated species at risk and provide a global capacity to map land uses in terms of conservation of biodiversity. A national forest genetic resources conservation strategy is being developed that will provide a framework for future conservation initiatives.

The priority of **Northern and Aboriginal Communities** is supported through the sustainable forest management and urban, regional & international partnerships, and First Nations/Aboriginal forestry capacity-building activities. It is enunciated through community-based partnerships and strategic economic development initiatives aimed at strengthening the capacity of Aboriginal peoples to engage in on-the-ground application of sustainable forestry practices across Canada.

The First Nations Forestry Program (FNFP), a joint initiative of NRCan and Indian and Northern Affairs Canada (INAC), supported 173 community-based initiatives with the objective of increasing First Nations capacity and access to forest-based economic opportunities. These included the New Brunswick Aboriginal forestry initiative, a $4 million four-year partnership initiative that was launched in 2004 to provide training and jobs in the forest industry for Aboriginal people. In Saskatchewan, the FNFP continued to support the Meadow Lake Tribal Council's summer School-to-Work Program which features a combination of standard industry training and traditional teaching by community elders. Through the Whitefeather Forestry Initiative, the FNFP worked with the Pikangikum First Nation in northwestern Ontario toward developing a land use strategy that will allow them to strike a balance between economic benefits and cultural uses of their traditional territory. In B.C., the program continued to assist bands to compile information and develop plans to apply for forest harvesting licences. Fire protection and fire fighting training continues to be important for many of Canada's northern communities. For example, the FNFP financially supported a number of bands in Saskatchewan and Alberta to receive training in these activities in 2004-05.

Together with the forest industry, the provinces and national parks, the First Nations are among the main players in NRCan's flagship Model Forest Program. With a total funding of $18.5 million for 2004-05 and over 230 sustainable forest management projects being conducted, this program promotes research and demonstrations of innovative sustainable management through 11 model forests across Canada. Canada's concept of model forests continued to generate strong interests abroad and many countries are adopting the Canadian approach. In 2004-05, projects and studies on Aboriginal values, traditional knowledge, non-timber forest products and habitat disturbance impacts on trapping were undertaken at the Western Newfoundland Model Forest with the Innu Nation of Labrador, the Waswanipi Cree Model Forest in northern Quebec, and through the Model Forest Network's Aboriginal Strategic Initiative.

Program Activity #4: Minerals and Metals

Minerals and Metals - ($M)	Main Estimates	Actual Spending
Key Programs/Services Related to Achieving Departmental Priorities		
• Knowledge, Innovation and Productivity	26.4	23.9
• Trade and Investment	4.6	3.6
• Energy and the Environment	0.7	0.7
• Northern and Aboriginal Communities	0.7	1.2
• Public Safety and Security	5.3	4.0
Sub-Total – Key Programs/Services	37.7	33.4
Sub-Total – Other Programs/Services	7.8	16.7
Sub-Total – Program	**45.5**	**50.1**
Corporate Management	15.1	17.4
Total -Program	**60.6**	**67.5**
FTEs	621	621

The **Minerals and Metals** program is the Government of Canada's leader in promoting the sustainable development and responsible use of Canada's mineral and metal resources. A fundamental objective of the program is to develop: (i) technologies and solutions to problems in order to increase the competitiveness of the mining and processing industries; and (ii) new materials and processes to enhance the competitiveness of the construction, transportation and energy sectors.

The program includes significant international activities to address barriers to market access and to communicate the benefits of Canadian expertise and products. Minerals and metals activities also focus on assessing the investment climate for exploration and mining in Canada and abroad and making policy recommendations. The program aims to increase the contribution of mineral development to the prosperity and well-being of Aboriginal and northern communities.

The program applies its extensive knowledge and expertise to: (i) fulfil its statutory responsibilities for mining projects under the *Canadian Environmental Assessment Act*; (ii) develop environmental technologies for application both at home and throughout the developing world; (iii) limit the impact of climate change; and (iv) ensure that environmental policies and regulations pertaining to the mining industry are based on sound science. Finally, the program is committed to enhancing the security and safety of: (i) workers in underground mines through the development of new technologies; and (ii) Canadians through the implementation of explosives regulations under the *Explosives Act* and the development of advanced technologies.

Performance Assessment Against Departmental Priorities [1]

Knowledge, Innovation and Productivity – During the reporting period, the Minerals and Metals program undertook more than 100 projects to enhance the productivity and competitiveness of Canada's mining industry and to maintain the viability of Canada's 150 communities that depend on mining. For example, the program continued to develop and apply new technologies to process gold ores that both increase the extraction of gold and reduce the use of costly and toxic reagents such as cyanide. The work was initiated in partnership with Canadian gold mining companies in 1994. To date, the application of the research has been significant. In one year, a gold mine in Manitoba reduced its cyanide consumption to the point that its effluent treatment plant was no longer required. Mining operations that implemented the technology benefited from increases in the recovery of gold that range from $500,000 to $17 million per year. In some applications, the process extended the life of a mine as well as the jobs of employees. The economic benefits of the consortium's projects since 1994 are estimated to be $62.9 million due to a combination of increased gold production and reduced operational expenditures, including the cost of reagents and effluent treatments. More importantly, cyanide consumption was decreased by as much as 50 percent, reducing the risk to the environment and the health and safety of mining employees. In 2004, researchers received a Federal Partners in Technology Transfer Award in recognition of their outstanding work in improving gold extraction techniques and reducing environmentally hazardous discharge.

The Minerals and Metals program received other national mining awards during the reporting period, including the Canadian Institute of Mining, Metallurgy and Petroleum's (CIM) distinguished lecture award for a review of recent developments in the hydrometallurgical processing of base-metal ores and concentrate – a topic of relevance to the program's ongoing efforts to sustain Canada's base-metal smelting and refining industry.

Listed below are other key mining achievements of the Minerals and Metals program during 2004-05:

- In cooperation with the CIM and Canada Economic Development, the narrow-vein mining project concluded with a well-attended international symposium in Val-d'Or, Quebec. A total of 192 delegates from eight countries met to discuss innovative solutions to the challenges of economically mining narrow-vein deposits.
- The Deep Mining Research Consortium, led by the Minerals and Metals program, launched four projects. Mining ore at depth in an existing operation is more economical and environmentally friendlier than opening a new mine. The projects will address health and safety issues, including specific topics such as heat, ground control, hoisting and backfill.

[1] A full description of the key programs/services – by program activity and departmental priority – can be found in Annex #3. This annex also contains information on expected results, performance indicators, and performance rating against 2004-05 milestones/targets; it also includes financial information for other programs/services under these program activities.

- The construction of an annex to the program's experimental mine in Val-d'Or, Quebec, was completed. The annex will be used for a five-year, $3.2 million research project on wireless underground telecommunications in cooperation with Canadian universities, telecommunications companies and other government departments.

Another objective of the Minerals and Metals program is to develop new materials and processes that improve the productivity and competitiveness, as well as the safety and environmental performance, including the reduction of GHG emissions, of Canada's construction, transportation, and energy sectors. For example, program researchers, working in partnership with the transportation sector, developed a new procedure for testing bolting systems. The program's bolt-load retention test has been adopted by automotive companies and was used to develop a new, lightweight magnesium engine cradle that is now in production. The engine cradle weighs less, making vehicles more fuel-efficient while retaining the durability and other safety features of engine cradles made of heavier materials.

Hydrogen fuel cells offer exciting opportunities for cleaner energy production, but the provision of safe, reliable hydrogen fuel storage systems still presents considerable technological challenges. Program researchers developed a novel process for charging and re-charging a lightweight magnesium-iron alloy hydride without applying high pressure or temperature. The process is safer than the high-pressure gas storage systems currently used to store hydrogen.

In the construction sector, one of the greatest challenges is to prevent concrete from deteriorating when it is exposed to other chemicals such as road salts. The program's researchers found that lithium-based admixtures, applied to existing highway structures, were effective in controlling the alkali-silica reactions that can cause deterioration in concrete structures. These results have influenced the recommendations of the Canadian Standards on Concrete.

Canada's energy industry depends on an extensive network of pipelines to transport oil and gas. A ruptured pipeline is expensive to repair and can cause extensive environmental damage. The Minerals and Metals Program developed an innovative technology that monitors stresses in pipelines and enables the early detection of cracks, internal corrosion, buckling and bending of pipes. The technology will be particularly useful for the continuous monitoring of pipelines in environmentally sensitive areas such as wetlands, rivers and the North.

An important part of the innovation system is the transfer and use of new technologies through contributions to international standards. The program's researchers developed a new mould design that minimizes defects in the standardized casting of test bars in lead-free copper alloys. The program also contributed to international standards in the areas of welding consumables, the fabrication of steel offshore structures, and methods for evaluating substances to inhibit corrosion inside pipelines.

Other applications of new technology by the Minerals and Metals program include the development of a graphite mould casting process for aluminum alloys. Graphite moulds, which are commonly used for zinc castings, were not previously applied to aluminum because of costs

and casting defects. As a result of advances by the program, aluminum alloy components with excellent properties have been produced. The program's aluminum alloys castings, using the improved graphite mould technology, exceed the mechanical properties required for aerospace applications. A client reported that the process has generated considerable interest among its customers throughout North America and that the technology was an important factor in its decision to expand its operations in Montréal.

Non-destructive testing (NDT) to analyze materials, structures and components helps to maintain public safety. The Minerals and Metals program manages the Canada-wide initiative to certify personnel who apply NDT methods (e.g., industrial radiography and ultrasonic technology). During the reporting period, 531 individuals were certified in NDT methods and an additional 986 individuals had their certificates renewed. Also, 93 individuals with Health Canada and the Canadian Nuclear Safety Commission were certified.

As with the Minerals and Metals program's other activities, advanced materials researchers received numerous awards from national and international institutions during the reporting period. For example, researchers were recognized by:

- the Canadian Standards Association (CSA) for leadership and technical contributions in the area of welding technology, fatigue and fracture in offshore structures;
- ASM International, the world-wide society of materials engineers and scientists, for dedication to advancing industry technology and applications of metals and materials;
- the Technical Cooperation Program for work on welding and contributions to the low-heat welding of nickel-aluminum-bronze and related materials; and
- the American Foundry Society for outstanding contribution to the development and transfer of lead-free copper alloy, copper alloy casting, and light-metals casting technologies to nonferrous foundries.

Trade and Investment – Given the international scope of Canada's mining industry and the highly competitive nature of commodity markets, it is crucial that Canada maintain a highly competitive investment climate, including its tax regime. The Minerals and Metals program monitors competitiveness issues and provides the analysis and policy recommendations to ensure that Canada's investment climate for mining remains competitive.

The mining industry, including exploration activities, and mining and smelting operations, is located in every province and territory in Canada. Consequently, the Minerals and Metals program strives to maintain strong relationships with the various levels of government across Canada's diverse regions to address mining issues. During the reporting period, the program provided expert analysis and advice on the impact of transportation costs and local infrastructure as it relates to the competitiveness of Canada's mining industry.

Base-metal reserves have been declining in Canada, thereby increasing the vulnerability of Canada's 150 mining communities to mine closures. Therefore, during the reporting period, the Minerals and Metals program proposed a deep drilling tax credit to stimulate exploration for base metals and, as a result, expand reserves. Also, an action plan was developed with provincial

The Minerals and Metals program's statistical activities support all five of NRCan's priorities. The above photo of participants at the annual meeting of the Federal-Provincial-Territorial (FPT) Committee on Mineral Statistics illustrates the extensive intergovernmental partnerships that the Minerals and Metals program has established to ensure the availability of accurate, timely and consistent statistics on mining across Canada's 13 jurisdictions. The FPT Committee promotes the sharing of data, the elimination of duplicate efforts, and the development of consensus on priorities. In the Auditor General's 2005 Annual Report, the program's statistical activities were cited as a model for other organizations to follow, especially with respect to federal-provincial-territorial cooperation and partnerships.

governments to address competitiveness issues, such as fiscal and taxation policy, financial security, and an improved regulatory process. Information on base- and precious-metal reserves was compiled and published, and trends in mineral exploration were examined in collaboration with the provinces and territories. The publication, *Overview of Trends in Canadian Mineral Exploration*, was nominated for an award by the international *Mining Journal* in Great Britain. A senior analyst received the Prospectors and Developers Association of Canada's Distinguished Service Award for his contribution to the analysis of mineral deposits in Canada.

Canadian mining companies operate in over 100 countries and, as a result, face a wide range of investment issues. Under the Prime Minister's Strategic Working Group on China, the Minerals and Metals program developed a memorandum of understanding (MOU) with the National Development and Reform Commission of the Government of China that aims to address investment issues facing Canadian mining companies operating in China. In addition, an MOU was signed with the U.S. Department of Commerce to promote cooperation in the field of minerals and metals and to launch joint activities.

The Minerals and Metals program also held the Forum on Mining Investment: A Catalyst for Developing Country Relations – Focus on Africa to inform senior government officials on the role that mining has played, and continues to play, in promoting Canada's economic and political interests around the world. Five Canadian members of Parliament and officials from Foreign Affairs Canada, Export Development Canada and the Canadian International Development Agency, as well as representatives of 10 African nations, participated in the forum.

During the reporting period, the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development was launched. The intergovernmental forum came about as a result of two preparatory meetings of the Global Dialogue on Mining, Metals and Sustainable Development – an initiative sponsored by Canada and South Africa at the 2002 World Summit on Sustainable Development to bring together like-minded governments with an interest in the mining, minerals and metals sectors. At a meeting, held in Geneva, Switzerland, in June 2004,

participants unanimously approved Canada to act as the secretariat to the intergovernmental forum for the first five years.

As of February 2005, the forum came into effect with 26 members confirmed. The forum also received strong support from the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Department of Economic and Social Affairs (UNDESA). The forum will examine and promote the contribution of the mining, minerals and metals sectors to sustainable development and provide a platform for governments to exchange information that will help in responding to the global challenges facing these sectors. The forum will also be particularly relevant to developing countries as they endeavour to use their natural resources wisely while reducing poverty.

The vast majority of the minerals and metals produced in Canada are exported. In 2004, Canada exported $55 billion of mineral and metal commodities, accounting for over 10 percent of Canada's total exports. Therefore, it is vital that access to international markets be secured and enhanced. During the reporting period, the Minerals and Metals program succeeded in preventing chrysotile from being included on the Prior Informed Consent list of the Rotterdam Convention. The exposures and risks of chrysotile have been demonstrated to be manageable. At the same time, Canada agreed to the listing of four other forms of asbestos whose exposures and risks were deemed to be unmanageable in their occupational use. The program also provided expert knowledge and advice on mineral and metal trade issues to International Trade Canada, ensuring that the interests of Canada's mineral and metal industries were represented in ongoing trade negotiations with countries seeking accession to the World Trade Organization.

With the support of Brand Canada, the Minerals and Metals program expanded the participation of Canadian suppliers of equipment and services to the mining industry in trade shows. According to a survey, the sales of suppliers rose between $20 million and $46 million due to their participation in the trade shows in 2004. To address the scarcity of data about the needs and composition of these suppliers, the development of a database was initiated.

The Kimberley Process is the principal international initiative to respond to the troubling linkage between rebel conflicts and trade in rough diamonds in a number of African countries. Canada's commitment to the Kimberley Process is met through the *Export and Import of Rough Diamonds Act*. Under the act, the Minister of Natural Resources is responsible for the control of the production, export and import of rough diamonds in Canada. During the reporting period, the Minerals and Metals program successfully implemented the act in Canada. Internationally, the program played a leading role in the Kimberley Process in collaboration with Foreign Affairs Canada. For example, the program continued to chair the Kimberley Process's international statistical working group and to participate in all other working groups.

Energy and the Environment – To better ensure that proposed mining activities minimize their impact on the environment, the Minerals and Metals program fulfilled NRCan's statutory obligations as the responsible authority for mining-related projects under the *Canadian Environmental Assessment Act*. This work was done in cooperation with other federal

departments and provincial or territorial authorities. For example, the Minerals and Metals program continued its lead role in the environmental assessment of De Beers' Victor diamond mine in northern Ontario and fulfilled its statutory obligations for additional environmental assessments in British Columbia and Nunavut.

As with the Government of Canada as a whole, the Minerals and Metals program is committed to "smart government", including a transparent and predictable regulatory system that fulfils public policy objectives efficiently while eliminating unintended impacts. The program participated in the five-year reporting of the *Canadian Environmental Protection Act* and the consolidation of federal environmental assessment activities. The program also undertook studies aimed at improving the efficiency and effectiveness of environmental assessments and initiatives to further harmonize regulations. In addition, the program participated in Fisheries and Oceans Canada's fisheries habitat modernization program to ensure the balanced application of regulations and policies affecting mineral development.

Recycling is an important part of Canada's commitment to reduce GHG emissions. The Minerals and Metals program initiated 35 projects as part of an Enhanced Recycling Program (ERP) for minerals and metals under Action Plan 2000 on Climate Change. The target for emissions reduction under this program is 0.7 Mt/y of CO_2 equivalent by 2010. An extension of the ERP has been requested through the Budget 2005 reporting process. In addition, a new enhanced recycling initiative has been proposed and was highlighted in the budget.

Many of the recent advances in mining productivity have resulted from using heavy equipment underground. However, most of this equipment is diesel-powered, which pollutes the air that miners breath and produces GHG emissions. During the reporting period, research in underground mining applications explored the use of emission-free fuel cells, including the testing of a four-tonne fuel cell locomotive. Minerals and metals research also focussed on managing the environmental issues of mining effluents, acidic mine drainage and mining legacies. A better understanding of the key chemical and microbial mechanisms that facilitate natural treatment of mine contaminants is key to the cost-effective treatment of mine effluents. Research on the use of passive wetlands has led to this technology being implemented at Canadian mines. Research was conducted by the Mine Environment Neutral Drainage (MEND) program and technology transfer workshops were held in Sudbury and Vancouver. The Minerals and Metals program also hosted the National Orphaned/Abandoned Mines Initiative (NOAMI), a multi-stakeholder program that is based on the MEND model. A multi-year action framework outlining key activities for NOAMI was approved by federal, provincial and territorial mines ministers during the reporting period.

Vehicles that weigh less are more energy-efficient and therefore emit fewer GHGs. The Canadian Lightweight Materials Research Initiative (CLiMRI) aims to develop lightweight metals and advanced high-strength steels for use in vehicles. Among recent accomplishments are: a prototype aluminum composite brake rotor that is 60 percent lighter and expected to last six times longer than conventional cast iron rotors; a prototype aluminum and advanced high-

strength steel tube for hydroforming applications; and a three-layer coating system for corrosion protection of magnesium alloy components.

The manufacture of portland cement, one of the most common components used in modern construction, involves the emission of large quantities of CO_2. The Minerals and Metals program has developed supplementary cementing materials to replace portland cement, thus reducing CO_2 emissions. With the cooperation of the Canadian International Development Agency, the program held seminars in India, attended by 2100 participants, to transfer the technology.

High-pressure oil and gas pipelines need to be reliable, both for economic reasons and to protect public safety and the environment. The program's researchers helped to minimize the chance of pipeline leaks and ruptures by developing new standards for fracture control and testing the strength of girth welds.

From left to right: Andy Yesno, Councillor, and Charlie Okeese, Chief of the Eabametoong First Nation (formerly Fort Hope First Nation); Gary Nash, ADM, NRCan; Hans Matthews, President, Canadian Aboriginal Minerals Association (CAMA); and Peter Recollet, Councillor, Wahnapitae First Nation. Mr. Yesno, Chief Okeese and the community of Eabametoong are featured in a recently-produced video designed to highlight the economic opportunities that mining offers to rural and first nation communities.

Northern and Aboriginal Communities – The mining industry is among Canada's largest actual and potential employers of Aboriginal people. The industry offers relatively long-term future employment opportunities, notably for younger Aboriginal people in rural and northern communities. The Minerals and Metals program is committed to ensuring that the benefits of mining are shared with Canada's Aboriginal people.

During the reporting period, the Minerals and Metals program accelerated its efforts to promote Aboriginal participation in the mining industry. Partnerships between the mining industry and Aboriginal groups were encouraged at fora, such as the Aboriginal-Mining Industry Round Table and the annual conference of federal, provincial and territorial mines ministers, and through ongoing dialogue with key Aboriginal organizations, the mining industry, and provincial and territorial governments. In support of capacity building and sound decision making within Aboriginal communities, several communication tools were developed, including: information bulletins, a mining video, and an on-line Aboriginal communities and minerals and metals activities maps portal. In 2004, the Minerals and Metals program received an award from the Council for the Advancement of Native Development Officers (CANDO), at its 11th annual national conference, in appreciation of the program's long-term contribution to CANDO.

Public Safety and Security – A principal aim of the Minerals and Metals program is the safety of workers and the Canadian public. However, following 9/11, a greater emphasis has been placed on activities related to security and anti-terrorism. For example, the program's explosives

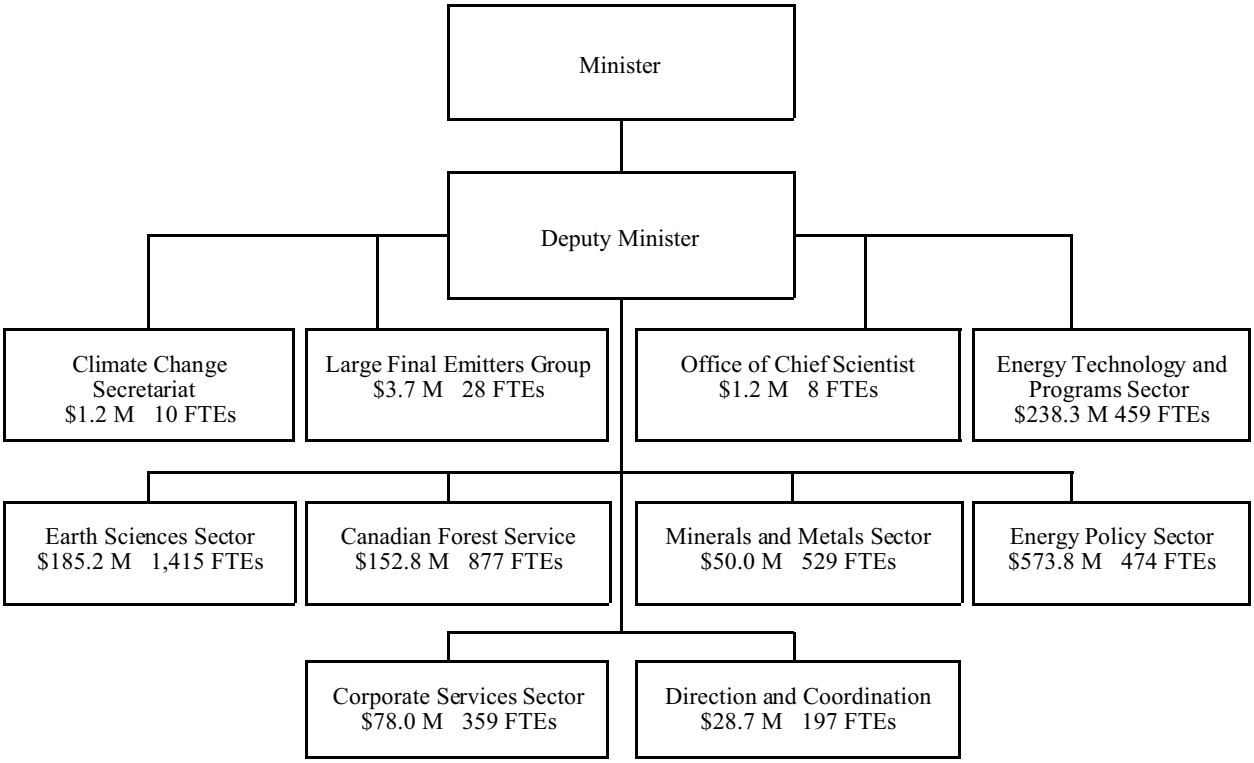
science and technology provides blast assessment and mitigation services to the public and private sectors, while explosives regulations and permitting develop regulations and programs to enhance the security of the supply of explosives in Canada.

Since the tragic Oklahoma City bombing in 1995, the potential misuse of fertilizers has become a great concern. During the reporting period, consultations with stakeholders resulted in the development of a policy to control the sale of consumer quantities of explosive precursors, such as the fertilizer, ammonium nitrate. In addition, approximately 1200 inspections of explosives licensees were undertaken with generally high rates of compliance and no prosecutions were initiated. Approximately 1500 energetic products were authorized and classified for the Canadian market. Moreover, the program strove to meet changing requirements, including those imposed by the passage of the new *User Fees Act* for the authorization of new explosive user fees. A report on this subject was submitted to the Treasury Board Secretariat in March 2005. Canada's system of controlling the importation, manufacture, storage, sale and transportation of explosives, pyrotechnics and other energetic material is internationally recognized as among the best in the world.

The objective of the Minerals and Metals program's explosives science and technology is to improve the safety and security of workers and the public from the threat of explosives. The program has developed, over the last few years, considerable expertise in the protection of people and civilian infrastructure from the effects of deliberate or accidental explosions. This expertise is increasingly in demand in today's security-conscious environment. For example, working in close partnership with Public Works and Government Services Canada, the program developed a software-based screening tool that allows the blast vulnerability of government buildings to be rapidly evaluated. The technology will improve the prioritization of spending on building retrofits. The program produced guidelines for the use of protective film to harden windows and a review of strategies for the protection of government assets against explosions. The program also assessed, on behalf of other federal departments and the private sector, the vulnerability to blasts of a wide range of structures from heritage buildings in downtown Ottawa to airport facilities. In partnership with NRCan's Energy Infrastructure Protection Division and under the U.S.-Canada Smart Border initiative, the program helped to reduce the blast vulnerability of vital cross-border energy infrastructure such as oil and gas pipelines and hydro-electric generating stations. Finally, the program contributed to the reduction in terrorism by achieving advancements in the marking, identification and detection of sheet explosives. The advancements were presented to the International Civil Aviation Organization. A database of commercial explosives was also delivered to Canadian and U.S. security agencies to assist with the identification of explosives. During the reporting period, the Minerals and Metals program's explosives research received national and international recognition, including an award from the American Society for Testing and Materials.

Section III - Supplementary Information

Organizational Information



* FTEs shown are based on the 2004-05 Main Estimates

Accountabilities

- Climate Change Secretariat – Head, Climate Change Secretariat
- Large Final Emitters Group – Assistant Deputy Minister, Large Final Emitters Group
- Office of Chief Scientist – Chief Scientist
- Earth Sciences Sector – Assistant Deputy Minister, Earth Sciences Sector
- Canadian Forest Service – Assistant Deputy Minister, Canadian Forest Service
- Minerals and Metals Sector – Assistant Deputy Minister, Minerals and Metals Sector
- Energy Policy Sector – Assistant Deputy Minister, Energy Policy Sector;
- Energy Technology and Programs Sector – Assistant Deputy Minister, Energy Technology & Programs Sector
- Corporate Services Sector – Assistant Deputy Minister, Corporate Services Sector
- Direction and Coordination – Corporate Directors Generals from the Corporate Policy and Portfolio Coordination Branch; Audit and Evaluation Branch; Communications Branch; and Legal Services.

Financial Crosswalk Between the Planning, Reporting and Accountability Structure (PRAS) and the Program Activity Architecture (PAA)

PRAS - Strategic Outcomes	PAA - Strategic Outcome*
Information dissemination and consensus building	Canadians derive sustainable social and economic benefits from the assessment, development and use of energy, forest and mineral resources, and have the knowledge to mitigate environmental impacts and respond effectively to natural and man-made hazards.
Economic and social benefits	
Environmental protection and mitigation	
Safety and security of Canadians	
Sound departmental management	

* For the purpose of presentation, NRCan's strategic outcome will be shortened to "Sustainable development and use of natural resources" in Section III.

1. Comparison of Planned to Actual Spending and Full Time Equivalents

			2004-05			
($ millions)	2002-03 Actual	2003-04 Actual	Main Estimates	Planned Spending	Total Authorities	Actual Spending
Sustainable development and use of natural resources	991.2	1,215.4	1,092.9	1,230.2	1,492.7	1,312.9
Less: Non-respendable revenue	(68.9)	(128.3)	(150.3)	(150.3)	(255.1)	(255.1)
Plus: Cost of services received without charge	39.5	39.6	38.0	38.0	38.0	39.1
Net cost of program	**961.8**	**1,126.7**	**980.6**	**1,117.9**	**1,275.6**	**1,096.9**
Full Time Equivalents (FTEs)	**4,233**	**4,301**	**4,356**	**4,356**	**4,356**	**4,356**

2. Use of Resources by Strategic Outcome

	2004-05 Budgetary ($ millions)					
Strategic Outcome	**Operating**	**Capital**	**Grants and Contributions**	**Total: Gross Budgetary Expenditures**	**Less: Respendable Revenue**	**Total: Net Budgetary Expenditures**
Sustainable development and use of natural resources						
Main Estimates	675.5	12.7	445.3	1,133.5	(40.6)	**1,092.9**
Planned Spending	687.8	12.7	570.3	1,270.8	(40.6)	**1,230.2**
Total Authorities	731.8	12.7	784.5	1,529.0	(36.3)	**1,492.7**
Actual Spending	**656.2**	**8.4**	**684.6**	**1,349.2**	**(36.3)**	**1,312.9**
Variance	**(75.6)**	**(4.3)**	**(99.9)**	**(179.8)**	**0.0**	**(179.8)**

3. Voted and Statutory Items

		2004-2005 ($ millions)			
	Vote or Statutory Item	Main Estimates	Planned Spending	Total Authorities	Actual Spending
1	Operating expenditures	578.8	590.2	629.6	562.4
5	Capital expenditures	12.7	12.7	12.7	8.4
10	Grants and contributions	289.8	289.8	291.1	194.8
(S)	Minister of Natural Resources - Salary and motor car allowance	0.1	0.1	0.1	0.1
(S)	Contributions to employee benefit plans	58.4	59.3	58.8	58.8
(S)	In support of infrastructural costs directly or indirectly relating to the exploration, development, production or transportation of oil and gas in the offshore area of Nova Scotia	1.6	1.6	3.1	0.7
(S)	In support of infrastructural costs directly or indirectly relating to the exploration, development, production or transportation of oil and gas in the offshore area of Newfoundland	1.4	1.4	2.2	1.0
(S)	Contribution to the Canada/Newfoundland Offshore Petroleum Board	3.6	3.6	1.0	1.0
(S)	Contribution to the Canada/Nova Scotia Offshore Petroleum Board	2.5	2.5	2.3	2.3
(S)	Payments to the Nova Scotia Offshore Revenue Account	30.0	55.0	80.4	80.4
(S)	Payments to the Newfoundland Offshore Petroleum Resource Revenue Fund	116.4	116.4	175.0	175.0
(S)	Geomatics Canada Revolving Fund	(2.4)	(2.4)	6.6	(1.5)
(S)	Sustainable Development & Technology Canada	0.0	100.0	100.0	100.0
(S)	Newfoundland fiscal equalization offset payments	0.0	0.0	129.3	129.3
(S)	Spending of proceeds from the disposal of surplus crown assets	0.0	0.0	0.4	0.2
(S)	Collection agency fees	0.0	0.0	0.0	0.0
	Total NRCan	**1,092.9**	**1,230.2**	**1,492.7**	**1,312.9**

4. Net Cost of Program

($ millions)	2004-2005
Total Actual Spending	**1,312.9**
Plus: Services Received without Charge	
Accommodation provided by Public Works and Government Services Canada (PWGSC)	14.4
Contributions covering employers' share of employees' insurance premiums and expenditures paid by TBS (excluding revolving funds)	22.9
Worker's compensation coverage provided by Social Development Canada	0.3
Salary and associated expenditures of legal services provided by Justice Canada	1.5
Total Services Received without Charge	**39.1**
Less: Non-respendable Revenue	(255.1)
2004-05 Net Cost of Program	**1,096.9**

5. Contingent Liabilities

($ millions)	March 31, 2003	March 31, 2004	Current as of March 31, 2005
Claims and Pending and Threatened Litigation	446.7	493.9	693.9
Guarantees	181.4	102.3	23.2
Total Contingent Liabilities	**628.1**	**596.2**	**717.1**

6. Loans, Investments, and Advances (Non-budgetary)

($ millions)	April 1st 2003	April 1st 2004	New loans issued	Payments received	Outstanding balance March 31st 2005
Sustainable development and use of natural resources					
Loan to Atomic Energy of Canada Ltd. for housing	0.1	0.0	0.0	0.0	0.0
Loan to Atomic Energy of Canada Ltd. for heavy water inventory	5.5	4.5	0.0	1.0	3.5
Loan to facilitate the implementation of the Hibernia Development project	55.2	46.0	0.0	9.2	36.8
Loan to Nordion International Inc.	90.0	86.0	0.0	4.0	82.0
Investment in the Lower Churchill Development Corporation	14.8	14.8	0.0	0.0	14.8
Investment in Atomic Energy of Canada Ltd.	164.2	164.2	0.0	0.0	164.2
Total	**329.8**	**315.5**	**0.0**	**14.2**	**301.3**

7. Source of Respendable and Non-Respendable Revenues

			2004-05			
($ millions)	Actual 2002-03	Actual 2003-04	Main Estimates	Planned Revenue	Total Authorities	Actual Revenue
Respendable Revenue						
Sustainable development and use of natural resources	37.2	37.4	40.6	40.6	36.3	36.3
Non-Respendable Revenue						
Sustainable development and use of natural resources	68.9	128.3	150.3	150.3	150.3	255.1
Total Respendable and Non-Respendable Revenue	**106.1**	**165.7**	**190.9**	**190.9**	**186.6**	**291.4**

8. Geomatics Canada Revolving Fund

Statement of Operations

($ millions)	Actual 2002-03	Actual 2003-04	2004-05 Main Estimates	2004-05 Planned Spending	2004-05 Total Authorities	2004-05 Actual Spending
Respendable revenues						
Products	11.6	12.5	11.7	11.7	11.7	**11.1**
Services	3.0	3.4	4.1	4.1	4.1	**4.2**
Consulting	1.7	0.5	2.0	2.0	2.0	**0.8**
Total respendable revenues	**16.3**	**16.4**	**17.8**	**17.8**	**17.8**	**16.1**
Operating expenses:						
Cost of sales	2.9	3.3	2.9	2.9	2.9	**3.5**
Salaries and employee benefits	7.0	4.9	6.0	6.0	6.0	**5.5**
Depreciation	0.5	0.4	0.6	0.6	0.6	**0.2**
Repairs and Maintenance	0.3	0.5	0.4	0.4	0.4	**0.6**
Administrative and support services	2.9	2.0	2.1	2.1	2.1	**1.6**
Utilities, materials, and supplies	0.5	0.3	0.5	0.5	0.5	**0.3**
Rental	0.3	0.2	0.4	0.4	0.4	**0.2**
Interest	0.1	0.1	0.1	0.1	0.1	**0.0**
Transportation and communication	0.6	0.3	0.6	0.6	0.6	**0.2**
Professional and special service	3.2	2.3	3.7	3.7	3.7	**2.7**
Total operating expenses	**18.3**	**14.3**	**17.3**	**17.3**	**17.3**	**14.8**
Operating surplus (deficit)	**(2.0)**	**2.1**	**0.5**	**0.5**	**0.5**	**1.3**

8. Geomatics Canada Revolving Fund (continued)

Statement of Cash Flows

($ millions)	Actual 2002-03	Actual 2003-04	2004-05 Main Estimates	2004-05 Planned Spending	2004-05 Total Authorities	2004-05 Actual Spending
Surplus (deficit)	**(2.0)**	**2.1**	**0.5**	**0.5**	**0.5**	**1.3**
Add non-cash items						
Non cash item: depreciation	0.6	0.5	0.6	0.6	0.6	**0.2**
Change in working capital	2.9	0.5	1.3	1.3	1.3	**(0.6)**
Other items	0.0	0.0	0.2	0.2	0.2	**0.0**
Investing activities						
Capital acquisitions	(0.2)	(0.1)	(0.2)	(0.2)	(0.2)	**0.0**
Cash surplus (requirement)	**1.3**	**3.0**	**2.4**	**2.4**	**2.4**	**0.9**

Use of Authority

($ millions)	Actual 2002-03	Actual 2003-04	2004-05 Main Estimates	2004-05 Planned Spending	2004-05 Total Authorities	2004-05 Actual Spending
Authority	5.0	5.0	5.0	5.0	5.0	5.0
Drawdown:						
Balance at April 1	(0.2)	1.1	4.1	4.1	4.1	**4.1**
Surplus (drawdown)	1.3	3.0	2.4	2.4	2.4	**0.9**
Cash at March 31	1.1	4.1	6.5	6.5	6.5	**5.1**
Adjustment for charges and credits against the authority after March 31	(4.0)	(2.5)	(2.5)	(2.5)	(2.5)	**(1.9)**
Balance of authority at March 31	**2.1**	**6.6**	**9.0**	**9.0**	**9.0**	**8.1**

Note: Columns may not add due to rounding

9. Resource Requirements by Sector and Organization

($ millions)	2004-05 Main Estimates	Planned Spending	Total Authorities	Actual Spending
Sustainable development and use of natural resources				
Earth Sciences	182.4	187.5	206.1	185.2
Canadian Forest Service	161.0	161.0	171.7	152.8
Minerals and Metals	45.5	45.5	51.7	50.0
Energy Technology and Programs	244.4	244.4	296.4	238.3
Energy Policy	345.7	477.9	645.7	573.8
Corporate Services	74.3	74.3	79.5	78.0
Direction & Coordination	18.3	18.3	33.9	28.7
Climate Change Secretariat	16.8	16.8	1.9	1.2
Large Final Emitters Group	2.8	2.8	4.3	3.7
Office of the Chief Scientist	1.7	1.7	1.5	1.2
Total	**1,092.9**	**1,230.2**	**1,492.7**	**1,312.9**

10A. User Fees

User Fee	Fee Type	Fee Setting Authority	Date Last Modified	2004-05			Planning Year		
				Forecast Revenue ($000)	Actual Revenue ($000)	Full Cost ($000)	F/Y	Forecast Revenue ($000)	Estimated Full Cost ($000)
Explosives licence and inspection fees	R	EA	Aug. 93	1,170	1,190	4,917	2005-06 2006-07 2007-08	1,200 1,200 1,200	4,959 4,959 4,959
Seismic data	O	RaTS	Mar. 04	905	895	1,025	2005-06 2006-07 2007-08	925 925 925	1,059 1,059 1,059
Map products	O	RaTS, CLSA	Mar. 04	1,490	952	1,057	2005-06 2006-07 2007-08	774 655 555	852 819 699
ISO non-destructive testing	O	RaTS	Nov. 02	905	907	906	2005-06 2006-07 2007-08	950 950 950	950 950 950
Photo products	O	RaTS	Mar. 04	740	727	762	2005-06 2006-07 2007-08	509 543 554	533 569 580
ATIP Requests	R	ATIA	1992	1,014	716	1,863	2005-06 2006-07 2007-08	900 900 900	2.250 2,250 2,250
Other products	O	RaTS	Mar. 04	890	358	356	2005-06 2006-07 2007-08	588 588 587	594 594 593
Subscrip-tion data	O	RaTS	Mar. 04	565	563	665	2005-06 2006-07 2007-08	377 377 377	445 444 444
Certified reference material	O	RaTS	1999	500	424	589	2005-06 2006-07 2007-08	424 424 424	589 589 589
	Sub-Total Regulatory: *Sub-Total Other Products and Services:* **Total**			2,184 *5,995* **8,179**	*1,906* *4,826* **6,732**	*6,780* *5,361* **12,141**	2005-06 2006-07 2007-08	6,647 6,561 6,471	12,231 12,233 12,123

O - Optional
R - Regulatory
ATIA - *Access to Information Act*
EA - *Explosives Act*
RaTS - *Resources and Technical Surveys Act*
CLSA - *Canada Lands Surveys Act*

10B. User Fee – Policy on Service Standards for External Fees

A. External Fee

External Fee	Service Standard	Performance Result	Stakeholder Consultation
Explosive licenses	95% of the time, initial factory applications will be completed within 60 days of receipt of completed documentation; renewals and all other authorizations will be processed within 30 days of a complete request. See other info below or visit our website: www.nrcan.gc.ca/mms/explosif	Licensing turnaround times have been acceptable to stakeholders. Formal service standards which reflect the current service delivery timelines are under development.	Consultations held in late summer of 2005 have been accepted within stakeholder groups. No formal complaints to this proposal are anticipated.
Seismic data	For provision of accurate location and magnitude of strong earthquakes in Canada, turnaround time is normally within 2 hours during working hours and within 4 hours outside of working hours. Preliminary confirmation is normally available to clients within 15 minutes during normal working hours and on our website: www.seismo.nrcan.gc.ca. For all other requests for standard seismic data, turnaround time is within five working days. Complex requests are negotiated with the client.	Service standards are reviewed annually (inquiries are recorded) - results indicate greater than 95% compliance with standards.	None planned at present. During the recent Lithoprobe project, seismic data was made available through the Lithoprobe Seismic Processing Facility (LSPF) in Calgary. Regular consultation provided through LSPF will continue. To encourage client feedback on service expectations, a questionnaire is being developed, and will accompany each response to a data request.
Map products	NTS maps: NRCan sells maps on a wholesale basis to a limited distribution network, and service standards reflect this. Response time for information requests is two working days. Order processing time: five working days after confirmation of payment is received. Hours of operation, 08:30 - 16:30 EST.	Mapping Services Branch is certified ISO 9001:2000, hence undergoes regular management review of quality objectives, discrepancy reporting processes, and client consultation. Performance issues are addressed through ISO Quality Objectives which are updated each year to address issues that may arise. Aggregate annual data is available on request.	In those areas of the sector that are under the ISO-9000 framework – such as the Mapping Services Branch – the service standards are reviewed continuously as part of their Discrepancy Management Reports (DMRs). The Regional Distribution Committee meeting with NRCan representatives in September 2005 will confirm service support to our distributors and address any performance issues.

External Fee	Service Standard	Performance Result	Stakeholder Consultation
ISO Non-Destructive Testing (NDT)	1 - Two weeks for processing of a candidate's application form. This period is advertised on application forms 'Instructions for Candidates' available in hard copy or electronically from the NDT Web site: http://ndt.nrcan.gc.ca All candidates have this information before applying. *Note: Assessment of foreign applications or unusual training/experience situations may require more time. 2 - Examination results are usually available three weeks from the date of examination. This period is clearly specified in 'letter of approval' issued to the candidate to permit him/her to challenge an examination.	The progress of each client application is recorded and tracked throughout the process. While performance has not been formally aggregated to summarize performance against service standards, the absence of stakeholder complaints indicates satisfaction that the published delivery standards are being met.	Fee adjustments are presented and negotiated with the 12 member advisory body of stakeholders. The agreed price structure associated with fees for required services and reports is put into effect and not changed for 3 years. The stakeholders like the stability in knowing what they will be paying for the next 3 years.
Photo products	Air Photos (National Air Photo Library or NAPL) - Order processing time of ten working days, priority service five working days; response time for information requests of ten working days 80% of the time; production error rate of 1.5% or less; hours of operation, 08:30 - 16:30 EST. For more info see: www.airphotos.nrcan.gc.ca	As with maps, performance issues are addressed through ISO Quality Objectives which are updated each year to address issues that arise. Performance results are monitored continuously. Aggregate annual data is available on request.	A survey of NAPL clients was conducted in 2004 to identify current and future needs and trends in the usage of current NAPL holdings. This resulted in a better understanding of client's present and future needs. There are no immediate plans for future additional consultation.
ATIP requests	Established by ATIP regulations.	As reported in Parliamentary Report.	None planned.
Other products	For aeromagnetic (and gravity data), the Geoscience Data Centre (GDC) of ESS provides maximum 10 day turn-around on external requests for data (average turnaround for a standard request is one day). We also provide on-line access through the Geoscience Data Repository for Geophysical and Geochemical Data (GDRGG). For more info on service standards see: www.ess.nrcan.gc.ca/intl/standards/index_e.php.	Performance is aggregated against standards annually. 95% of requests are in compliance with standards. The number of inquires has dropped significantly since data has been made available free of charge thought the GDRGG.	Client consultation is performed on an ongoing basis. All web-based clients are provided with a client satisfaction questionnaire including a request for suggestions for improvement. Advent of the GDRGG (web-based access) has significantly reduced requests via the GDC.

External Fee	Service Standard	Performance Result	Stakeholder Consultation
Subscription data	National Topographic Data Base (NTDB) - Response time for general information requests is two working days during business hours. Availability of web-site is 24-7 90% of the time, monitored monthly. Preparation of a subscription agreement, within 10 working days of receipt. Return agreement signed by both parties within 10 working days after the document and the client's payment (when applicable) are received. Open connections following a subscription within 2 working days after payment of the subscription fees and the agreement signed by the client are received.	Complaints acknowledged within two working days - and as per ISO procedures, corrective action is taken immediately. Performance results are monitored continuously. Aggregate annual data is available on request.	Client consultation is ongoing - part of regular ISO process.
Certified reference material	Adherence to the quality standards is verified by audits to ISO 9001:2000. The service standards for the quality of CCRMP reference materials are stated in ISO Guides 30, 31, 33, 34 and 35. The service standards for delivery of CCRMP reference materials are "80% of the orders must be dispatched within one day and all in 3 days. Rush orders within one day." The service standards for the quality of Proficiency Testing Program for Mineral Analysis Laboratories (PTP-MAL) samples are stated in ISO/IEC Guide 43. Additional service standards relate to the number of samples prepared for particular elements and the deadline for sending the reports to participants and the Standards Council of Canada.	Over the past two years: standards for the quality of CCRMP reference materials have been met 99%; standards for the dispatch of CCRMP reference materials have been met 99.8% under normal circumstances; standards for the quality of PTP-MAL samples have been met 95.3%; standards for report delivery was met 67% (% is affected by small data sample).	Advisory Committee to CCRMP is comprised of 21 external stakeholders who meet yearly. Web sites list all products and prices. The web sites are updated on an as-needed basis but at least once a year: www.nrcan.gc.ca/mms/canmet-mtb/mmsl-lmsm/ccrmp. Clients are surveyed every three years for the reference materials and every two years for PTP-MAL. Complaints are dealt with by the unit leader within one week of receipt. For the reference materials in 2004, complaints were received representing 1% of all orders. For PTP-MAL in 2004, complaints were received representing 2% of all data-submissions

External Fee	Service Standard	Performance Result	Stakeholder Consultation

B. Other Information

The Explosives Regulatory Division (ERD) remains committed to managing its regulatory activities in an effective and efficient manner to ensure public and worker health and safety while protecting Canada's explosives supply from criminal and terrorist interests. ERD is committed to delivering 95% of decisions on requests for explosives product authorizations, importation permits, display fireworks and pyrotechnics certificates, user magazine licences, vendor magazine licences, manufacturing certificates and factory licence renewals within 30 days of the receipt of complete applications and all necessary documentation. In the case of initial applications for a factory licence where the review is a more time consuming process, ERD is committed to delivering 95% of decisions within 60 days of the receipt of complete applications and all necessary documentation.

The proposed performance standards reflect a reasonable amount of time that could be taken to complete a regulatory activity (e.g., the amount of time required to review and make a decision regarding an application for a license). The standards identify an intent to meet the standard at least 95% of the time. This reflects the fact than on occasion, a regulatory decision may be delayed due to circumstances beyond ERD control and that on occasion, spikes in workload may prevent all decisions to be reached within the defined timeframe.

11. Response to Parliamentary Committees, Audits and Evaluations

Response to Parliamentary Committees
In November 2004, the Standing Senate Committee on Energy, Environment and Natural Resources tabled an interim report titled *"The One-Tonne Challenge: Let's Get On With It!"* **.** The report challenges individual Canadians to curb greenhouse gas (GHG) emissions – from water heating, appliances, lighting, and air conditioning – by about 20 per cent, or one tonne a year. This would, in turn, cut Canada's annual contribution to the world's GHG emissions by about 32 mega tonnes every year. In other words, Canadians are being asked to take responsibility for 32 of the 240 mega tonnes that will take us to our Kyoto target. The report has 15 recommendations. No government response was required. The report can be found at http://www.parl.gc.ca/38/1/parlbus/commbus/senate/com-e/enrg-e/rep-e/repintnov04-e.htm.

Response to the Auditor General
In April 2005, the Auditor General (AG) tabled *Chapter 1 - Natural Resources Canada: Governance and Strategic Management*, which stated that the department lacks a corporate strategic plan that addresses its legislative mandate and government priorities, and that the department has not established appropriate emergency plans in all of its responsibilities (see Section IV, Corporate Management, Advancing modern management).

NRCan was one of several departments audited in *Chapter 4 - Sustainable Development Strategies—Using the Tax System and Managing Office Solid Waste.*

NRCan was one of three departments audited for *Chapter 5 - Rating Selected Departmental Performance Reports*. The AG found that most of the performance reports provided a good overview of each department's organizational context and planned strategic outcomes. However, performance expectations are not always clear and concrete, and the information does not necessarily focus on program results. Furthermore, the reported results are not always balanced and supported by data sources and data limitations. As well, the reports provided little evidence that performance information is used to make decisions about improving program results in future years.

More information on these chapters and departmental responses can be found at http://www.oag-bvg.gc.ca/domino/reports.nsf/html/05menu_e.html.

External Audit
OAG audit on the Market Development Incentive Payments (MDIP) – The audit findings confirmed that NRCan "has complied, in all significant respects, with sections 14 and 15 of the Memorandum of Agreement during the year ended March 31, 2003".

Internal Audits or Evaluations

Audits

- Acquisition Cards
- Audit of Internal Controls at Canada Centre for Remote Sensing (CCRS) - Ottawa
- Review of Occupational Health and Safety at Great lakes Forestry Centre
- Mapping Services Branch Audit
- Governance and Accountability Audit of Climate Change Action Fund (CCAF)
- Contributions under CCAF (see Section III, table 16)
- Audit of Accounting for Costs and Liabilities Related to Contaminated Sites
- Assessment of Class Grants and Contributions
- Review of Occupational Health and Safety at CANMET Materials Technology Laboratory
- Audit of Internal Controls at Legal Surveys Division - WROC
- Audit of Internal Controls at Canadian Forest Service - Edmonton
- Audit of Internal Controls at Canmet Energy Technology Centre (CETC) - Devon
- Audit of Internal Controls at CETC - Varennes
- Audit of Internal Controls at Geological Survey Canada - Dartmouth
- Official Languages - Language of Work
- Values and Ethics Review

Evaluations

- The Canadian Lightweight Materials Research Initiative (CliMRI) (see Annex 3, Minerals and Metals, Advanced material technology development)
- Transportation Fuels for Renewable Sources (see Annex 3, Energy, S&T Transportation)
- Buildings Programs (see Annex 3, Energy, Buildings)
- The Industrial Separation and Refrigeration Program
- Climate Change Impacts on Energy Sector (CCIES) (see Section III, Table 16)
- Renewable Energy Deployment Initiative (see Annex 3, Energy, Renewable energy programs)
- The Flaring Research Initiative (see Annex 3, Energy, Buildings)
- The Regulation, Construction and Maintenance of Pipeline Program
- The Groundwater and Soil Remediation Program (see Annex 3, Earth Sciences, Groundwater)
- Support the Development of Technological and Other Measures to Control and Reduce Emissions of Particulate Matter
- The Process Integration (PROCINT) Initiative (see Annex 3, Energy, Large final GHG reduction)
- Enhancement of Greenhouse Gas Sinks (EGGS) (see Annex 3, Energy, CO2 capture and storage)
- Alternative Energy R&D (see Annex 3, Energy, Renewable energy programs)

More information on these audits and evaluations can be found at:
http://www2.nrcan.gc.ca/dmo/aeb/English/Index.asp.

12. Sustainable Development Strategy

NRCan is currently implementing its sustainable development strategy (SDS), *Moving Forward*, tabled in Parliament on February 16, 2004.

Moving Forward is a strategic planning document that conveys a unified, forward thinking vision and articulates an organizational commitment to sustainable development that encompasses all of the department's diverse sectors and activities. The three-year strategy focuses on four key results that are considered by NRCan, its clients and partners, to be the most significant to the natural resource sectors, and the areas where NRCan is considered to be able to make a contribution to sustainable development – both in terms of our strengths as a department and the substantive public issues that the department is positioned to address. The strategy provides an overarching framework that links to policies and strategies within NRCan's sectors, such as the National Forest Strategy and the Minerals and Metals Policy of the Government of Canada. As well, the strategy provides a linkage between the department's activities and the federal government-wide priorities for sustainable development.

NRCan reports on progress towards, and completion of, each of the SDS targets, through the Sustainable Development Action Items Management System, the department's on-line reporting tool (http://sd-aims.nrcan.gc.ca/index.aro). The department also prepares an annual report on progress towards its SDS, which can be found at http://www.nrcan-rncan.gc.ca/sd-dd/pubs/prog_e.html.

The Program Activity Architecture (PAA), which enables the department to link resources to results, also provides a means to report on accomplishments towards sustainable development, given that the raison d'être and strategic outcome for the department is the sustainable development and use of natural resources.

13. Procurement and Contracting

The Treasury Board Secretariat's 2005 Management Accountability Framework (MAF) assessment indicates that the department has a highly controlled and centralized approach to contracting. Contracting authority of $5,000 for goods and services is automatically delegated to all Responsibility Centre managers across the department, however, this delegation is not tied to knowledge and capacity. The departmental contracting functional authority awards all contracts above $5,000, as well as provision of advice and guidance to managers.

NRCan has developed and maintained an Intranet site that provides information on procurement operational policies and many other contracting tools. The department has actively disclosed contracts over $10,000 and has acted on all recommendations contained in previous audits on contracting.

14. Storage Tanks

The status of NRCan's registered fuel storage tanks, as at March 31, 2005, is indicated in the table below. This information is reported in the DPR as required under Schedule II of the *Canadian Environmental Protection Act* (CEPA).

Type of Tank	# Registered	# Compliant	# Non-compliant	# Need Upgrading
Aboveground storage tank	10	8	2	2
Underground storage tank	5	3	2	2

15. Service Improvement Initiative (SII)

The 2005 MAF assessment states that "*NRCan shows no clear evidence of adherence to the SII. A review of departmental reporting provides no evidence to suggest that the department has been engaged in service improvement activity that includes the measurement of client satisfaction or a service improvement plan as outlined in the Policy Framework for Service Improvement in the Government of Canada*".

Although results are not available, the department is progressing in its implementation of service improvement activities. The department registered for use of the Common Measurement Tool (CMT) with the Institute for Citizen-Centred Service, and provided an in-house course on the use of the CMT to service delivery managers. NRCan also recently completed an inventory of services that identified over 400 client facing services. As a follow-up to this inventory, the department is exploring an integrated framework to collect, maintain and update survey information.

16. Listing of Transfer Payment Programs Exceeding $5 million/year

In 2004-05, NRCan managed the following transfer payment programs in excess of $5 million. Further information on these transfer payment programs can be found at http://www.nrcan.gc.ca/css/fmb/fmb-e.htm.

1. Model Forest Program
2. Assistance to the Canadian softwood lumber sector (includes Canada-China Wood Products Initiative)
3. Measures to mitigate the impact of the Mountain Pine Beetle (MPB) epidemic
4. Payments to the Nova Scotia Offshore Revenue Account
5. Payments to the Newfoundland Offshore Petroleum Resource Revenue Fund
6. In support of energy efficiency and alternative energy programs
7. In support of the EnerGuide for Houses Retrofit Initiative
8. Climate Change Action Fund (Technology Early Action Measures and Impacts and Adaptation)
9. In support of organizations associated with impact and adaptation research related to climate change (includes CCAF funds from above)
10. Contribution in support of carbon dioxide capture and storage projects
11. Wind Power Production Incentive Contribution Program
12. Contribution in support of the Technology and Innovation Initiative
13. Contribution in support of the Ethanol Expansion Progaram
14. In support of electricity distributors to promote the sale of electricity from emerging renewable energy sources.
15. Hibernia interest assistance
16. Newfoundland fiscal equalization offset payments

17. Foundations (Conditional Grants)

In 2004-05, NRCan contributed to the following foundations (conditional grants). Further information can be found at http://www.nrcan.gc.ca/css/fmb/fmb-e.htm.

1. Sustainable Development Technology Canada
2. Green Municipal Funds

18. Horizontal Initiative - Climate Change

In 2004-05, the department actively contributed to the development of a horizontal results-based management accountability framework for federal climate change activities. NRCan's contribution included direct financial and staff contribution to the project office of the Treasury Board Secretariat leading this initiative. Officials from the various sectors of the department also played a significant role in providing their expertise to help shape the framework as well as supplying detailed information on their climate change activities and programs to assist in documenting the framework. At the end of 2004-05, the framework was near completion.

The department has also started providing support to the Commissioner of the Environment and Sustainable Development with respect to the planned audit of climate change programs to be completed by 2006. The Commissioner, which is part of the Office of the Auditor General of Canada, has conducted audits in the past on aspects of climate change policy and results have been released in annual reports of the years 1997, 1998 and 2001.

Further information on this horizontal initiative can be found at http://www.tbs-sct.gc.ca/rma/eppi-ibdrp/hrdb-rhbd/profil_e.asp.

19. Travel Policies

NRCan follows and uses the Treasury Board Secretariat's travel policies parameters as per instructions included in the *Special Travel Authorities* and the *Travel Directive***.**

Section IV - Other Items of Interest

Corporate Management

The Corporate Management activity is focussed on ensuring leadership and good management practices, compliance with government policy, reporting to Parliament, as well as transactional services to the other four program activity areas. Within this activity, the corporate services sub-activity provides support in the following functional areas: financial management; information management; human resources management; workplace well-being; environmental affairs; security, safety and emergency management; contracting and procurement; information technology; and real property. Other services are provided to the department through the following sub-activities: policy and portfolio coordination; audit, risk management and evaluation; S&T coordination (which includes NRCan On Line), communications and legal services. The resources for this activity are distributed across the Earth Sciences, Energy, Forest and Minerals & Metals program activities.

Performance Rating*
★★★ Expectations Exceeded
★★ Expectations Met
★ Expectations Not Yet Fully Met

* Ratings apply to 2004-05 milestones/targets only.

★ **– Advancing modern management** – Through its Management Accountability Framework (MAF), NRCan was able to make the necessary changes to facilitate better program delivery in order to meet its departmental priorities. This was confirmed by the Treasury Board Secretariat's (TBS) 2005 MAF assessment which commended the department for its work in a number of areas, including cooperating on the results-based management of climate change; completing the renewal of departmental grants and contribution programs in compliance with the Policy on Transfer Payments; and participating in key governmental programs and initiatives (i.e., HR classification; risk management; bilingualism; values and ethics). TBS was also pleased that the department had responded positively to some areas identified for improvement in last year's MAF assessment (i.e., centralized real property organization; enhanced internal audit function; and climate change audit and evaluation frameworks). However, the MAF assessment indicates a major concern for the department's inability to comply with requests for providing data, suggesting that an information system to track this data is required.

Moreover, the MAF findings identified a "lack of strategic policy function to anticipate challenges in nuclear energy and Atomic Energy of Canada Limited (AECL)" as an area of major concern. In its response, the department outlined the steps that had been taken over the past few years to put in place the building blocks for a long term nuclear strategy within which AECL can operate. Over the last year, NRCan has received Cabinet support for continued funding of the Advanced CANDU Reactor Program in 2005-06, worked with the Corporation to develop an improved Corporate Plan addressing central agency concerns, established the basis for a future

program dealing with AECL's legacy liabilities, and secured drafting approval for amendments to the *Nuclear Liability Act*. NRCan is continuing work on these nuclear related issues as well as the development of an over arching nuclear policy framework.

An audit conducted by the OAG states that "*the department does not have a corporate strategic plan that addresses its legislative mandate and government priorities, is communicated to staff, and serves to align sector business plans. It needs good governance and management processes at the corporate level to focus its efforts*". In its response to the OAG, the department recognized this need and is presently in the process of developing a corporate strategic plan for publication in the spring of 2006.

NRCan has undertaken several improvements in the area of information management/information technology to ensure overall enhancement of governance and management in these two vital functions. For example, the department approved the Departmental Security Policy, and implemented measures to enhance the security of employees, information and IT equipment.

★★ – **Shared services** – In January 2004, NRCan adopted a shared services approach to maximize efficiencies and effectiveness by reducing costs (estimated potential savings between 9 and 18 percent) and improving internal service functions, sharing and levering resources, people and information, standardizing processes, consolidation and re-engineering of work. The Shared Services Office (SSO) was created in June 2004. First migration of almost 500 positions took place in January 2005 for finance and procurement, human resources, information technology (network/server management and user support) and mail/messenger functions. A second migration of remaining positions is planned to take place during 2005-06 which will include information technology (applications), facilities management, and communications.

The SSO will work with the Government of Canada to ensure that NRCan's work is consistent with the functional transformation occurring government-wide. As part of the department's expenditure review commitment, the SSO is committed to 20 percent savings of the established baseline of services by 2009-10. The savings will be the result of smarter procurement, as well as productivity and operational efficiencies.

★ **– Human resources management** – The OAG's April 2005 periodic report indicated that *"The department is faced with an aging, specialized workforce. Yet, it does not have a clear understanding of the competencies and capacities of its current workforce and those that it will need to acquire*". In its response, the department recognized the need to develop and implement a human resources (HR) plan that aligns the competencies required with future business needs, recognizing the challenges implicit in the department's dependence on sunset funding. It has begun to do so through the NRCan 2005–2008 Strategies for the Management of Human Resources which was approved in the spring of 2005. As well, NRCan began the process of integrating business and HR planning.

With respect to the implementation of the *Public Service Modernization Act,* NRCan has established a Forum of Modernization Champions and working groups to develop an implementation strategy for the department. Moreover, an internal Informal Conflict Management Officer was appointed.

Even though there was improvement in the representation of all employment equity groups, the department recognizes that overall gaps continue to persist for women and visible minorities. A major concern, as noted in the 2005 MAF assessment, was the department's slow progress in implementing the Embracing Change Initiative, which is below the overall federal public service benchmark. Further detailed performance information on employment equity issues is reported in the Employment Equity Progress Report. In the area of official languages (OL), detailed performance information on the OL program is found in the Annual Review of Official Languages. Both reports can be found at http://www.nrcan.gc.ca/css/hrsb/hrsb-e.htm.

★ – **Real property management and strategy** – The 2005 MAF assessment indicated that TBS is pleased that NRCan is considering a centralized real property organization and governance management regime to ensure prioritization and consistency in decision-making. Also, NRCan has continued to develop its long-term accommodation strategy for the National Capital Region where a majority of the department's deteriorated assets are located. The major challenges presented by the aging real property base are being addressed through a cooperative "whole of government" approach that will ensure the future sustainability of holdings.

Overall, capital deficiencies in real property continue to be addressed through the delivery of the final phase of the five-year $49 million Program Integrity Plan, whereby funds were allocated by Treasury Board. During 2004-05, NRCan implemented $5.5 million worth of essential building projects to address health and safety issues and asset-integrity problems. In addition, a new service agreement with Public Works and Government Services Canada for the provision of property and facilities management services has been drafted and will be ready for approval in 2005. The agreement will offer the flexibility necessary to conform to changing requirements and include performance measurement and monitoring provisions.

★★ **– S&T coordination** – NRCan's science management has been strengthened considerably through the creation of the Office of the Chief Scientist (OCS). To ensure the continued relevance of deparmental S&T activities, the OCS made significant progress in developing a departmental S&T Vision and S&T Directions for NRCan which will be used to guide the establishment of S&T priorities, delivery mechanisms and an effective governance structure for the department.

In its response to the OAG's April 2005 audit, the department recognized the need for improvements to its research project management systems. As an immediate measure to improve its S&T information, the department produced an internal S&T annual report (June 2004), and completed a study on S&T Information Needs Analysis (March 2005) to identify various internal and external reporting requirements for a departmental S&T Information Management System

(S&T IMS). This system should be operational in 2005-06 and will allow for an upward migration to a government-wide Enterprise Resource Planning system.

The department played a significant role in the organisation of a S&T forum "Moving from Collaboration to Integration" (January 2005) which was attended by 330 leaders from across the federal S&T community. Moreover, the department worked closely with other science-based departments and the TBS on its Capital Asset Review. More specifically, NRCan's Laboratory Coordinating Committee supported the creation of a national laboratory and equipment inventory housed on the PubliService website; the department was the first department to have all its inventory available on the site.

★★ **– NRCan-On-Line (NOL)** – As a science department, NRCan realizes the importance of a dynamic approach to managing data, sharing information, and integrating knowledge products and services, in terms that benefit both the department and its stakeholders. This recognition continued to be reflected in the department's contribution to the development of the Government of Canada (GoC) Service Vision and the leadership role it assumed to ensure that knowledge services were included in that vision.

Expectations on the NOL activities that addressed the following strategic priorities were met in 2004-05:

- accelerating the development of a knowledge infrastructure that supports federal S&T and policy activities (departmental search engine, content management strategy and initiation of a needs analysis);
- promoting innovative approaches to the mobilization of S&T and policy knowledge by leveraging the innovation within the department to achieve seamless integration of services and products through the multi-channel delivery model (inventory of client facing departmental services as a first step in understanding its current service delivery dynamics, partnership with TBS and Laboratory Coordination Committee pilot project to make laboratory assets inventory information available to all federal departments through a map interface on PubliService);
- transformation of service delivery to achieve the GoC Service vision (final directional business case for Interdepartmental Web Mapping and Visualization Initiative, grants and contributions and other transactional service moved on-line such as Youth Employment Strategy program and the Market Incentive Program);
- developing performance measures to demonstrate progress towards the NOL goal (Government-On-Line performance framework still under development, progress has not been made in building departmental performance measures); and
- leveraging stakeholders' expertise, knowledge and resources in support of service innovation (e-bookstores in Sherbrooke and across Forest program).

Annexes

1. Crosswalk Between RPP 2004-05 Key Commitments and DPR 2004-05 Achievements

The Report on Plans and Priorities for 2004-05 was produced under the old Planning, Reporting and Accountability Structure (PRAS) that was composed of five strategic outcomes (shaded black). The new Program Activity Architecture is composed of one strategic outcome – ***Canadians derive sustainable social and economic benefits from the assessment, development and use of energy, forest and mineral resources, and have the knowledge to mitigate environmental impacts and respond effectively to natural and man-made hazards*** – and four program activities (***Earth Sciences, Energy, Forest, Minerals & Metals***). Section II and Annex 3 of this report provide performance information by program activity and departmental priority, whereas Section IV provides performance information on corporate management issues.

RPP 04-05 Commitments by Strategic Outcome (under the PRAS)	**DPR 04-05 – Section II and Annex 3 (under the PAA)**				**DPR 04-05 Section IV**
	Earth Sciences	**Energy**	**Forest**	**Minerals & Metals**	**Corporate Mgmt**
Strategic Outcome #1 - To provide Canadians with information to make balanced decisions regarding natural resources.					
Horizontal delivery of scientific data, information and knowledge across multiple channels					√
Developing geospatial information for decision-making	√				
Furthering Canada's forest knowledge for balanced decision-making			√		
Enhancing existing and establishing new strategic partnerships in Canada's forest sector			√		
Strategic Outcome #2 - To provide Canadians with sustainable economic, social and environmental benefits derived from natural resources for present and future generations.					
Promoting renewable energy and cleaner fossil fuels		√			
Effective electricity policy, programs and S&T		√			
Stimulating new investment in mineral and energy exploration	√				

RPP 04-05 Commitments by Strategic Outcome (under the PRAS)	DPR 04-05 – Section II and Annex 3 (under the PAA)				DPR 04-05 Section IV
	Earth Sciences	Energy	Forest	Minerals & Metals	Corporate Mgmt
Providing sound economic development tools to people occupying Canada Lands	√				
Enhancing the competitiveness of Canada's forest sector			√		
Achieving mutual benefits from trade and investment abroad by the minerals and metals industries				√	
Optimizing the contribution of mineral development to Aboriginal communities				√	
Innovating in the minerals and metals industry for sustainable development				√	
Making Canada an investment location of choice for the minerals and metals industries				√	
Strategic Outcome #3 - To provide Canadians with strategies that reduce the environmental impacts of natural resources development and use.					
Addressing climate change and other environmental issues: • more energy efficient homes and equipment • more energy efficient on-road transportation • helping business and industry • reducing greenhouse gas emissions through carbon dioxide capture and storage • R&D for technologies to support reduced GHG emissions • establishing emissions reduction targets for large final emitters • federal leadership • air quality • adapting to a changing climate	 √	 √ √ √ √ √ √ √ √ 			
GHG emissions reduction through national forest-related initiatives			√		
Developing our resources sustainably	√				
Developing strategies and tools to protect Canada's forests and enhance productivity				√	
Long-term management of nuclear fuel waste		√			

RPP 04-05 Commitments by Strategic Outcome (under the PRAS)	DPR 04-05 – Section II and Annex 3 (under the PAA)				DPR 04-05 Section IV
	Earth Sciences	Energy	Forest	Minerals & Metals	Corporate Mgmt
Strategic Outcome #4 - To provide Canadians with enhanced safety and security.					
Meeting Canadians' safety and security needs: • natural hazards • radiation mapping • Smart Border Declaration • modernizing the *Nuclear Liability Act*	√ √	√ √			
Enhancing security of Canadians through tighter explosives control and pipeline monitoring				√	
Strategic Outcome #5 - To provide Canadians with a department that is efficiently and effectively managed.					
Advancing modern management					√
Improving our capacity to support program, science delivery and management functions*					√
Building a strong and diverse workforce					√
Effective management and delivery of departmental S&T					√

* Service Improvement Initiative captured in Section III, Table 15.

2. NRCan's Program Activity Architecture

Department/Agency	Natural Resources Canada			
Strategic Outcomes	Strategic Outcome #1 Canadians derive sustainable social and economic benefits from the assessment, development and use of energy, forest and mineral resources, and have the knowledge to mitigate environmental impacts and respond effectively to natural and man-made hazards			
'p' Program Activity	1a. Earth Sciences (sub-activities a-i below) 1b. Earth Sciences - Geomatics RF	2. Energy	3. Forest	4. Minerals and Metals
Program sub-Activity	a. Earth sciences for sustainable resource development b. Aboriginal Property Rights Infrastructure (5) c. Canadian Geospatial Infrastructure d. Earth sciences for strong and safe communities e. Earth sciences for a clean environment f. Earth sciences for northern development g. ESS-led National Initiatives h. Earth Sciences Program Activity - Management and Support (6)	a. Energy Policy b. Electricity and Renewable Energy c. Petroleum Resources d. Energy Efficiency and Alternative Transportation Fuels e. Energy S&T f. Large Final Emitters GHG reduction (1) g. Energy Program Activity - Management and Support	a. Forest Sector Economics & Policy b. Forest Knowledge & Information Synthesis c. Climate Change & Forest Fire Research d. Forest Production Research e. Forest Ecosystems Research f. Forest Protection & Biodiversity Research g. Forest Sustainability Partnerships & Outreach h. Forest Program Activity - Management and Support	a. Minerals and Metals Economic, Fiscal and Social Policy b. Minerals and Metals Industry Analysis and Business Development c. Minerals and Metals Science and Technology d. Explosives Safety and Security e. Minerals and Metals Programs f. Mineral and Metal Program Activity - Management and Support
Program Sub-sub-Activity	a-1 Consolidating Canada's Geoscience Knowledge a-2 Geoscience for Oceans Management (6) a-3 Sustainable Development Through Knowledge Integration a-4 Geomatics for Sustainable Development of Natural Resources (6) a-5 Gas Hydrates - Fuel of the Future? (6) c-1 Geomatics for connecting Canadians c-2 Canada Lands Survey System c-3 Canadian Geodetic Service (6) c-4 Earth Observation Data Services d-1 Natural Hazards & Emergency Response (2)(6) d-2 Aeronautical Charting d-3 Canada/United States International Boundary Maintenance and 1925 Treaty Implementation (6)	a-1 Energy Policy Development and Analysis (1) a-2 Opportunities Envelope (1) b-1 Electricity Resources Policy (5) (6) b-2 Renewable Energy Programs (1) b-3 Low-Level Radioactive Waste Management including Port Hope c-1 Petroleum Resources Policy c-2 CO2 Capture and Storage (1) c-3 Hibernia Interest Assistance c-4 Statutory Programs Atlantic Offshore c-5 Energy Infrastructure Protection (2) d-1 Housing (1) d-2 Buildings (1) d-3 Equipment (1) d-4 House in Order/Government Operations (1) d-5 Industry (1)	a-1 Sustainable Forest Policy and Stakeholders Relations (1) a-2 International Forest Leadership and Protocols (1) (6) a-3 Competitiveness of Canada's Forest Sector (6) a-4 Social and Economic Research (6) b-1 Forest Information Systems and Inventory b-2 Forest Information Synthesis and Dissemination c-1 Forest Carbon Modelling (1) c-2 Impacts and Adaptation (1) c-3 Forest Fire and Management Practices (1) d-1 Forest Biotechnology (4)	a-1 Economic and Regional Analysis (6) a-2 Tax and Exploration (6) a-3 Aboriginal Affairs and Sustainable Communities (5) (6) b-1 International Liaison and Trade Relations (6) b-2 Industry and Commodity Market Analysis (6) b-3 Business Development (6) c-1 Mining, Processing and Environmental Research (1) (6) c-2 Advanced Materials Technology Development (1) (6) d-1 Explosives Regulations and Permitting (2) (6) d-2 Explosives Science and

'p' Program Activity	1a. Earth Sciences (sub-activities a-h below)	2. Energy	3. Forestry	4. Minerals and Metals
	1b. Earth Sciences - Geomatics RF			

Program Sub-sub-Activity				
	e-1 Groundwater (3)	d-6 Transportation (1)	d-2 Forestry Practices (1)	Technology (2) (6)
	e-2 Reducing Canada's vulnerability to Climate Change (1) (6)	d-7 Outreach (1)	e-1 Forest Productivity	e-1 Minerals and Metals Statistics Collection and Dissemination (2) (6)
	e-3 Metals in the Environment (6)	e-1 Built Environment (1) (6)	e-2 Native Insects and Diseases	
	e-4 Legislated environmental and resource assessments	e-2 Power Generation (1) (3) (6)	f-1 Alien Invasive Species	e-2 Environmental Assessments And Regulatory Processes (6)
	f-1 Northern resources development	e-3 Transportation (1) (4) (6)	f-2 Pest Management (3) (4) (5)	e-3 Special Projects and Strategic Priorities (2) (6)
	f-2 Geomatics for northern development	e-4 Conventional Oil and Gas (1) (3) (6)	f-3 Forest Health Monitoring and Reporting	
	f-3 Canada-Nunavut Geoscience Office	e-5 Unconventional Oil and Gas (1) (3) (6)	f-4 Water / Air Quality (3)	
	g-1 Climate Change Impacts and Adaptation (1) (5) (6)	e-6 Industrial Sector (1) (3) (4) (6)	f-5 Biodiversity Monitoring and Conservation Strategies	
	g-2 GeoConnections (5)		g-1 Sustainable Forest Management and Urban, Regional & International Partnerships (6)	
	g-3 Deliniating Canada's Continental Shelf UNCLOS		g-2 First Nations / Aboriginal Forestry Capacity-building (5)	
	g-4 Polar Continental Shelf Project (6)		g-3 Private Woodlots	

Legend:
1. climate change
2. public safety and anti-terrorism
3. water
4. biotechnology
5. Aboriginals
6. international

3. Background Information on Key Programs/Services by Program Activity and Departmental Priority

NRCan has one strategic outcome which is supported by four program activities: Earth Sciences, Energy, Forest, Minerals and Metals. This annex presents information by program activity and key programs/services that directly support the departmental priorities identified in Section I, and the overall program activity assessments from Section II. It should be noted that although a performance rating is provided for each of its key program/services in this annex, an explanation is provided only if the expectations are not yet fully met – i.e., if the results are not unfolding as expected or if certain elements are problematic. The department is also providing an explanation where expectations are "generally" met, i.e., where the multiple project nature of the sub-sub activity precludes a definitive assessment. **The ratings or self-assessments apply to 2004-05 milestones and/or targets only and are derived from various sources such as: business and operational plans, accountability frameworks, performance agreements, internal/external audits and evaluations, independent internal/external assessments, impact studies, client surveys, etc.** This annex also includes information for other programs/services by program activity.

★★★ Expectations Exceeded
★★ Expectations Met
★ Expectations Not Yet Fully Met – Explain

Program Activity #1: Earth Sciences (includes the Earth Sciences - Geomatics Canada Revolving Fund)

Earth Sciences – Key Programs/Services

Departmental Priority – Knowledge, Innovation and Productivity: $26.4M Actual Spending

★★ – Gas hydrates - fuel of the future - $1.8M

This sub-sub-activity contributes to the development of gas hydrates as an unconventional energy source, in order to ensure a secure energy supply. It identifies the scientific and technological knowledge required for the sustainable development of this resource for areas in Canada that host large gas hydrates deposits, mainly in the high Arctic and in offshore areas, at water depths commonly greater than 600 metres on the Pacific and Atlantic margins, but at shallower depths in the Arctic seas. Two strategies are being followed: one will focus on leveraged industrial collaboration and the maintenance of a globally acknowledged and highly motivated scientific team, and the other on the development of a gas hydrates policy roadmap, in collaboration with other sectors in NRCan and industry.

- Expected Result – Gas hydrates are recognized as a potentially significant energy source. / Perf. Ind. – Public acknowledgment of the potential of gas hydrates as a significant energy source by senior government and industry officials.
- Expected Result – Canadian industry engaged in assessment of potential of gas hydrates as a resource. / Perf. Ind. – Investment by Canadian industry in gas hydrate projects.

★★ – Geoscience for oceans management - $10.0M

This sub-sub-activity contributes to the geoscience knowledge that is required to inform decision-making in Canada's offshore lands, so that land use, including offshore structures, and resource development decisions balance social, economic, and environmental considerations. Underpinning this program is a systematic approach to seafloor mapping to deliver geoscience knowledge for integrated ocean management. The legislative and strategic framework for this program is found in the *Canada Oceans Act* and Canada's Oceans Strategy.

- Expected Result – Conflicts over seafloor use are resolved, and the environmental impacts of offshore structures are minimized through use of NRCan geoscience knowledge. / Perf. Ind. – Other government departments and non-governmental organizations acknowledge that their environmental planning and seafloor conflict resolution is informed by NRCan products.
- Expected Result – Canada's Oceans Strategy successfully delivered on a foundation of integrated seafloor mapping. / Perf. Ind. – Organizations committed to delivering the Oceans Strategy acknowledge seafloor mapping as key for their success.
- Expected Result – Petroleum, fisheries and communications sectors recognize seafloor mapping is cost effective. / Perf. Ind. – Petroleum, fisheries and communications sectors working in the Canadian offshore employ seafloor mapping methods.

★★★ – GeoConnections - $8.9M

This sub-sub-activity delivers consolidated geospatial information to Canadians to foster knowledge about Canada, to enable better policy and business decisions, and to advance Canada as a world-class leader in developing and using innovative on-line content and services. With this initiative, geographic data and information, visualization tools and data-discovery services interoperable will be easily accessible on the Internet.

- Expected Result - Decision-making related to federal priority issues increases use of online geospatial information to address complex issues. / Perf. Ind. - Increase in size of policy/end-user communities aware of and taking advantage of Canadian Geospatial Data Infrastructure (CGDI).
- Expected Result - Decision-making have increased access to user-defined geospatial information available from closest point to source. / Perf. Ind. - Increase in use of framework / distributed datasets in online applications.
- Expected Result - Stakeholders evolve business processes to share, jointly develop and use common geospatial services, tools and standards. / Perf. Ind. - Increase in use of CGDI services.
- Expected Results - Stakeholders are aware of benefits of sharing geospatial information online and transform business processes to enable it. / Perf. Ind. - Increase in policy and licensing changes amenable to CGDI.

★★ – Canada Lands Surveys System - $5.7M

In the role of corporate surveyor for the federal government, the Surveyor General of Canada protects the interests of the Government of Canada as the owner of the vast majority of Canada Lands, through the operation and maintenance of the Canada Lands Survey System (CLSS). The Surveyor General's Office sets, maintains and updates survey standards, maintains and provides access to the Canada Lands Survey Records, establishes a regulatory regime, and manages both the digital cadastral databases and ground-based survey frameworks. The regulatory regime includes the issuance of survey instructions, quality monitoring of surveys and survey products, and the ratification and confirmation of surveys and survey plans. The primary objective of the CLSS is to provide the foundation to establish property rights on Canada Lands, by defining, describing and documenting the extent of all land interests.

- Expected Result - Secure land tenure on Canada Lands and federal ocean space allows boundary certainty facilitating economic development. / Perf. Ind. - Land tenure is secure.
- Expected Result - A framework for integrating governance and property systems on all Canada Lands including federal ocean space is in place. / Perf. Ind. - Client satisfaction with the integration of governance and property systems.

Departmental Priority – Energy and the Environment: $20.5M Actual Spending

★★ – Groundwater - $4.1M

This sub-sub-activity was designed to help ensure clean and sustainable groundwater resources for all Canadians and to fill regional knowledge gaps of those resources. The intent is to provide governments with an inventory of groundwater resources and regional aquifer dynamics including recharge/discharge, sustainable yield and vulnerability to enable best groundwater management practices.

- Expected Result - Hydrogeological information used by governments to assess the sustainability and quality of key Canadian aquifers, and to make water supply and waste management decisions. / Perf. Ind. - Other government organizations (federal, provincial, municipal) use NRCan hydrogeology information to assess aquifers and to support water supply and waste management decisions.

★★ – Reducing Canada's vulnerability to climate change - $7.4M

The goal of the Earth Sciences climate change sub-sub-activity is to reduce the vulnerability of Canadians, their communities, and the country's infrastructure to climate change. This goal will be achieved through conducting and publicizing research aimed at an improved understanding of the sensitivity of Canada's landmass and coastal areas, and through the incorporation of new knowledge in planning and resource management.

- Expected Result – Earth Sciences program activity data, knowledge and synthesis products used for climate change impact, adaptation and mitigation planning and international negotiations by Canadian government agencies. / Perf. Ind. – Stakeholders and stakeholder governments acknowledge the use and value of Earth Sciences program activity data, knowledge and synthesis products in climate change planning and negotiations.

★★ – Metals in the environment - $2.3M

This sub-sub-activity supports the assessment and management of ecosystem and human health risks posed by metals in the environment. It does so by informing regulations and risk management decisions with an improved understanding of the presence of metals in the environment, the source apportionment (human vs. natural), the processes controlling the concentration levels, their availability to enter the food chain, and historical accumulation trends.

- Expected Result - Decisions related to the assessment and management of the risk posed by metals in the environment to ecosystem and human health are informed by geoscience advice and information. / Perf. Ind. - Risk assessment and risk management decisions are informed by NRCan geoscience advice and information.

★★ – Legislated environmental and resource assessments - $1.2M

At the request of federal government agencies responsible for specialized land-use designations, (e.g. Parks Canada, DFO) and consistent with federal legislation and policy, the LERA program provides resource assessments so that the mineral and energy resource potential is duly considered when establishing protected areas. These assessments applies to lands under federal jurisdiction and under consideration as National Parks, Marine Protected Areas or other special designations that restrict mineral or energy development, including those in the Territories and Canada Lands offshore. In response to federal government agencies' requests and as required by the *Canadian Environmental Assessment Act* (CEAA) this sub-sub-activity also provides expert geoscience reviews of projects undergoing environmental assessment ensuring the identification, consideration and minimizing of adverse environmental impacts.

- Expected Result - Adverse environmental impacts of development projects are identified and minimized as required by the Canadian Environmental Assessment Act, and interdepartmental and intergovernmental consensus is reached on land use designation for proposed federal protected areas as required by federal policy and legislation. / Perf. Ind. - (a) Federal environmental assessment project reviews and (b) federal decisions on proposed protected areas informed through active provision of NRCan geoscience advice and information.

★★ – Climate change impacts and adaptation - $5.5M

This sub-sub-activity includes the Climate Change Impacts and Adaptation Program which aims to improve knowledge of Canada's vulnerability to climate change, to better assess the risks and benefits posed by a changing climate, and to build the foundation upon which appropriate decisions on adaptation can be made. The program supports research to fill critical gaps that limit knowledge of vulnerability; to undertake and support assessment of impacts and adaptation; to enhance collaboration between stakeholders and researchers; and to facilitate policy development. The knowledge generated in the program will feed into policy via the participation of decision-makers in the program elements, and through reports.

- Expected Result - Increased understanding of Canada's vulnerability to climate change and adaptation as a response strategy. / Perf. Ind. - Adaptation plans are developed and acknowledged as important and effective.
- Expected Result - Increased capacity to undertake research related to impacts and adaptation. / Perf. Ind. - New researchers and areas of expertise in research network and program proposals.
- Expected Result - Improved collaboration between research and stakeholder community with greater stakeholder engagement in research. / Perf. Ind - Number of proposals involving stakeholders in research process or on teams.
- Expected Result - Increased incorporation of adaptation in planning. / Perf. Ind. - Number of plans and actions citing climate change adaptation.

Departmental Priority – Northern and Aboriginals Communities: $34.5M Actual Spending

★★ – Aboriginal Property Rights Infrastructure - $7.1M

Building the capacity of Aboriginal people for economic and social development requires effective and culturally-aligned land administration systems that support a robust, reliable and flexible property rights infrastructure. This sub-activity is structured around support for the Comprehensive Land Claims in the North and British Columbia and support for key Aboriginal governance programs, including those flowing from the *First Nations Land Management Act*, treaty land entitlement programs, Indian and Northern Affairs Canada's Lands and Trusts Services program, Cadastral Operations on Aboriginal Lands (South) and Capacity Building-Cadastral Reform.

- Expected Result – Increased effectiveness and self-sufficiency of Aboriginal land and resource management. / Perf. Ind. – First Nations have delegated 53/60 authority or *First Nations Lands Management Act* governance. First Nations/Aboriginal communities have land and resource management self-sufficiency.
- Expected Result – Economic development in Canada through settlement of land claims. / Perf. Ind. – Land claims completed – comprehensive, specific, treaty land entitlement. New reserves/Aboriginal communities created.

★★ – Northern resources development - $27.4M

Future economic sustainability and quality of life for northern Canadians depends on the responsible development of mineral and energy resources. This sub-sub-activity develops and delivers an improved, expanded geoscience knowledge base to stimulate new private sector investment in mineral and energy exploration and development to create new opportunities for northerners. It also supports northern capacity building, in terms of increased understanding of geoscience for decision-making and increased employment opportunities provided by exploration companies. This sub-sub-activity includes the Targeted Geoscience Initiative (TGI) that provides integrated geoscience knowledge pertaining to areas of high energy and mineral potential, with the intent of stimulating private sector resource exploration.

- Expected Result – The amount and effectiveness of exploration and development for mineral and energy resources in northern Canada is increased as a result of an enhanced geoscience knowledge base. / Perf. Ind. – Exploration expenditures relative to 2002 levels and the number of discoveries attributable to enhanced geoscience knowledge.

Departmental Priority – Public Safety and Security: $11.7M Actual Spending

★ – Natural hazards and emergency response - $11.7M

This sub-sub-activity assists in the mitigation of natural hazards and is intended to reduce the loss of life and economic costs of natural disasters in Canada. The program works with national and international partners and clients to produce a modern robust analysis of earthquake shaking risk suitable for developing a modern building code; effective forecasts of magnetic storms and mitigation strategies against damage to electrical grids, satellite communication and pipelines; and natural hazards inventories and assessments, used to build effective response scenarios and disaster mitigation for populated centres at risk. The sub-sub-activity is enhanced through the provision of comprehensive digital and custom maps for emergencies, integrated hazard and infrastructure information and the capacity to measure radiation contamination from accidental dispersal or terrorist acts.

- Expected Result – Reduced risk from earthquakes, tsunamis, landslides, magnetic storms and volcanic eruptions through hazard assessments and ongoing monitoring. / Perf. Ind. – Assessments validated and published regularly. Monitoring and warning systems operate continuously.
- Expected Result – Improved emergency response to all hazardous situations enabled by NRCan maps, data and advice. / Perf. Ind. – Emergency response agency evaluations of emergency responses to real and simulated emergencies show increased satisfaction with products and advice provided by NRCan.
- Expected Result – Reduced risk from human threats to safety and security. / Perf. Ind. – Comprehensive Test Ban Treaty Obligations (CTBTO) reports that the Canadian contribution to the international monitoring system meets Comprehensive Test Ban Treaty obligations. Evaluations, done by lead agencies for the Federal Nuclear Emergency Response Plan, of emergency responses to real and simulated radiation incidents indicate that services provided by NRCan were effective.

• **Expectations Not Yet Fully Met** – see explanation in Section II, Earth Sciences program.

Earth Sciences – Other Programs and Services

Other Programs/Services ($M)	Main Estimates	Actual Spending
Consolidating Canada's geoscience knowledge	13.6	15.7
Sustainable development through knowledge integration	5.9	4.2
Geomatics for sustainable development of natural resources	12.5	13.0
Geomatics for connecting Canadians	5.8	7.5
Canadian Geodetic Service	6.0	6.0
Earth Observation Data Services	4.8	4.1
Aeronautical charting	-	-
Canada/U.S. international boundary maintenance and 1925 Treaty	1.2	1.0
Geomatics for northern development	9.7	7.8
Canada-Nunavut Geoscience Office	0.7	0.5
Polar Continental Shelf Project	6.5	6.9
Earth Sciences - Geomatics Canada Revolving Fund	(2.4)	(1.5)

Program management and support	21.3	26.9
Sub-Total	**85.6**	**92.1**
Corporate management	35.8	41.5
Total	**121.4**	**133.6**

Program Activity #2: Energy

Energy - Key Programs/Services

Departmental Priority – Knowledge, Innovation and Productivity: $89.1M Actual Spending

★★ – Energy policy development and analysis - $3.1M

This sub-sub-acitivity provides support and advice on the development and implementation of broad energy policy. This includes decision-making support and analysis on international energy issues, environmental issues pertaining to energy, (especially climate change), and other air quality issues, sustainable development and other long-term strategies, fiscal analysis, forecasting and other cross-cutting energy issues.

- Expected Result – The refinement of an energy framework in order to ensure a secure, reliable energy supply, and in that context, address environmental, climate change and security imperatives and develop new opportunities which will bring social and economic benefits to Canadians, in consultation with Environment Canada, other federal departments, industry and the provinces. / Perf. Ind. – Broad economic and sustainability indicators and the combined impact of energy policy, programs and S&T for the energy sector, such as energy production, energy efficiency and exports.

★★ – Electricity resources policy - $5.4M

Federal policy development, including strategies and programs and expert advice, in the area of renewable, electrical, and nuclear energy, uranium and radioactive wastes.

- Expected Result – Effective federal policy that meets Canada's energy security, economic, environmental, and social objectives in the areas of renewable, electrical, and nuclear energy, uranium and radioactive wastes. / Perf. Ind. – Progress in elaborating a renewable energy and wind energy strategy for Canada in cooperation with the provinces and territories. Completion of a report on the implementation of the recommendations of the U.S. Power System Task Force. Demonstrable progress in modernizing Canada's nuclear legislative framework, including a review of the *Nuclear Liability Act*. Government policy positions elaborated for the Advanced Candu and Generation IV technologies.

★★ – Petroleum resources policy - $6.4M

Canada's petroleum resources policy has been market-based since 1986, and rests on the principles of sustainable development and deregulation (with the National Energy Board (NEB) applying light-handed regulation to ensure a level playing field and protect the long term interest of consumers). Market-based policy relies on global and regional market forces and signals to both consumers and producers resulting in transparent, efficient and effective decision-making; the private sector is left to make investment allocations based on commercial market forces. In this context, this sub-sub-activity performs ongoing work related to Canadian oil policy, natural gas policy, offshore oil and gas policy, and energy infrastructure protection policy. This involves analysing and advising senior management on the state of domestic and international markets as well as on issues and developments affecting current policies or requiring new policy approaches. This can involve legislative and regulatory frameworks as well as trade frameworks. It can also involve liaising with PCO and other federal departments, the NEB, provincial energy departments, the oil and gas industry, the Canadian public, and foreign governments and international organizations.

- Expected Result – To contribute to efficient oil and natural gas markets in Canada, to ensure effective regulatory regimes are in place to promote those efficient markets, to provide accurate and insightful analysis and advice to senior management, and to liaise effectively with stakeholders. / Perf. Ind. – No performance indicators available.

★★ – S&T - Built environment - $5.0M

(see also the Energy and the Environment priority for balance of actual spending for this sub-sub-activity)

This sub-sub-activity consists of S&T (R&D and late-stage development and demonstration of technologies) for promoting the efficient and environmentally-friendly use of energy in new and existing residential and institutional buildings, both stand alone and as they form part of communities (i.e., community energy systems). It includes the integration of energy from renewable sources, particularly in remote communities that are not connected to the grid.

- Expected Result – New knowledge and advanced technologies that increase energy efficiency, and reduce the environmental impact of energy-use in new and existing residential and commercial building stock. / Perf. Ind. – Level of uptake of new knowledge contributing to increased energy efficiency and reduced emissions from buildings and communities. Level of uptake of advanced technologies contributing to increased energy efficiency and reduced emissions from buildings and communities.

Expectations Generally Met – see Section II, Energy program.

★★ – S&T - Power generation - $5.9M

(see also the Energy and the Environment priority for balance of actual spending for this sub-sub-activity)

This sub-sub-activity consists of S&T (R&D and late-stage development and demonstration of technologies) for promoting clean and efficient power generation, both centrally and distributed, the production of energy from renewable sources, and the reduction of greenhouse gas emissions and toxic pollutants from the production of energy from fossil fuels.

- Expected Result – New knowledge and advanced technologies that increase unit and system efficiency, and reduce emissions (e.g., GHG and non-GHG, including priority substances) and fossil-fuel dependency in power generation. / Perf. Ind. – Level of uptake of new knowledge contributing to increased energy efficiency and reduced emissions, e.g. greenhouse gas and non-greenhouse gas, including priority substances, and fossil-fuel dependency in power generation. Level of uptake of advanced technologies contributing to increased energy efficiency and reduced emissions, e.g. greenhouse gas and non-greenhouse gas, including priority substances, and fossil-fuel dependency in power generation.

Expectations Generally Met – see Section II, Energy program.

★★ – S&T - Transportation - $11.1M
(see also the Energy and the Environment priority for balance of actual spending for this sub-sub-activity)
This sub-sub-activity consists of S&T (R&D and late-stage development and demonstration of technologies) for promoting clean and efficient energy for the transportation sector. It encompasses transportation energy efficiency and optimization, advanced fuels such as ethanol, biodiesel and hydrogen, and the characterization of the combustion and emission reduction of those fuels, and infrastructure necessary to promote the adoption and use of those fuels.

- Expected Result – New knowledge and advanced technologies that increase efficiency and reduce the emissions and fossil-fuel dependency of the transportation sector. / Perf. Ind. – Level of uptake of new knowledge and advanced technologies contributing to increased energy efficiency and reduced emissions and fossil-fuel dependency of the transportation sector. Level of uptake of advanced technologies contributing to increased energy efficiency and reduced emissions and fossil-fuel dependency of the transportation sector.

Expectations Generally Met – See Section II, Energy program.

★★ – S&T - Conventional oil & gas - $20.2M
(see also the Energy and the Environment priority for balance of actual spending for this sub-sub-activity)
This sub-sub-activity consists of S&T (R&D and late stage development and demonstration of technologies) to address cross-cutting environmental and safety issues in support of the production of Canada's onshore and offshore oil and gas resources.

- Expected Result – New knowledge and advanced technologies on the production and transportation of onshore and offshore conventional oil and gas that enhance production, improve safety, and reduce environmental impacts. / Perf. Ind. – Level of uptake of new knowledge contributing to the production and transportation of onshore and offshore conventional oil and gas that enhances production, improves safety, and reduces environmental impacts. Level of uptake of advanced technologies contributing to the production and transportation of onshore and offshore conventional oil and gas that enhance production, improve safety, and reduce environmental impacts.

Expectations Generally Met – See Section II, Energy program.

★★ – S&T - Unconventional oil & gas - $22.3M
(see also the Energy and the Environment priority for balance of actual spending for this sub-sub-activity)
This sub-sub-activity consists of S&T (R&D and late-stage development and demonstration of technologies) for promoting the efficient, economic and environmentally-friendly development of Canada's unconventional fossil fuels, focussing on oil sands and heavy oil, coal bed methane, gas hydrates, and the frontier regions.

- Expected Result – New knowledge and advanced technologies on the production and processing of bitumen and heavy oil, and on the production of coal bed methane and gas hydrates that enhance production, improve product quality, and reduce environmental impact. / Perf. Ind. – Level of uptake of new knowledge contributing to the production and processing of bitumen and heavy oil, and on the production of coal-bed methane and gas hydrates that enhance production, improve product quality and reduce environmental impacts. Level of uptake of advanced technologies contributing to the production and processing of bitumen and heavy oil, and on the production of coal-bed methane and gas hydrates that enhance production, improve product quality and reduce environmental impacts.

Expectations Generally Met – See Section II, Energy program.

★ – S&T - Industrial sector - $9.7M

(see also the Energy and the Environment priority for balance of actual spending for this sub-sub-activity)

This sub-sub-activity consists of S&T (R&D and late-stage development and demonstration of technologies and process methodologies) to help industry use energy efficiently, reduce emissions and waste and use bio-based energy-related systems and technologies.

- Expected Result – New knowledge and advanced technologies that increase energy efficiency and reduce emissions at unit, process and system scales. / Perf. Ind. – Level of uptake of new knowledge contributing to increased energy efficiency and reduced emissions at unit, process and system scales. Level of uptake of advanced technologies contributing increase energy efficiency and reduce emissions at unit, process and system scales.

Expectations Not Yet Fully Met – See Section II, Energy program.

Departmental Priority – Energy and the Environment: $325.8M Actual Spending

★★★ – Opportunities Envelope (OE) - $0.6M

The Opportunities Envelope (OE) was announced in August 2003 and received an initial Treasury Board approval in February 2004. The three-year, $160 million OE is intended to allow the federal government to contribute funds to initiatives proposed by the provinces and territories that will result in cost-effective reductions in greenhouse gas emissions within their respective jurisdictions. Either discrete projects or broader emission reduction programs in any sector of the economy are eligible for OE funding. The OE is a joint NRCan/Environment Canada initiative: these departments will administer the OE funding but it is up to the provinces and territories to develop the emission reduction proposals in the first place and be willing to co-fund them.

- Expected result – The OE will result in increased collaboration with provinces and territories and their partners on climate change by supporting new projects and programs that will result in GHG emission reductions within their respective jurisdictions while contributing to national goals. / Perf. Ind. – Level of awareness and interest from provinces and territories through number of inquiries, bilateral meetings, conference calls and formal Expressions of Interest (EoI). Uptake of program through the number of jurisdictions participating and the number of complete proposals received and recommended for funding. Performance indicators for individual approved initiatives to be determined through contribution agreements.

★★ – Renewable energy programs - $14.0M

Federal policy development, including strategies, programs, and expert advice, in the area of renewable energy including solar, wind, water, earth and bioenergy, and energy from waste.

- Expected Result – Effective federal policy development and efficient delivery of several initiatives to encourage the development and use of renewable energy sources and technologies. / Perf. Ind. – Increase the proportion of electricity generated in Canada by emerging and low-impact renewable energy sources. Increase the proportion of electricity generated by emerging renewable energy sources in total federal electricity purchases to 20% by 2010. Significantly increase the proportion of electricity generated from wind energy in total electricity generation in Canada. To influence, by 2007, the deployment of 600 active solar thermal systems and high efficiency and low-emitting biomass combustion systems along with 6,000 ground source heat pump systems.
- **Expectations Generally Met** - See Section II, Energy program.

★★ – CO_2 capture and storage - $8.1M

CO_2-capture-and-storage, in general terms, involves the capture, treatment (additional, as required), transportation and injection of CO_2 into a suitable geological formation. In this process, CO_2 is first captured from a suitable industrial source. The CO_2-bearing gas stream is treated, as required, and transported to the intended geological storage site where it is injected into the selected geological formation. Potential commercial opportunities exist to store CO_2 while at the same time enhancing production in depleted oil reservoirs through enhanced oil recovery (EOR) or in un-minable coal beds through enhanced coal bed methane production (ECBM).

- Expected Result – To advance the understanding of the optimal use of the capture and subsequent storage of CO_2 in geological formations as a means of reducing Canada's greenhouse gas emissions and to promote its commercialization. The goal of the CO_2-Capture-and-Storage Initiative is to advance deployment of commercial opportunities and through a financial incentive program, to facilitate the development of a CO_2-Capture-and-Storage ($C0_2C\&S$) market. / Perf. Ind. – Phase I – number of staff hired and trained; final reports received on: identifying regulatory constraints, inventorying sources of $C0_2$ and additional suitable storage sites, health, safety and environmental impacts; messaging created for public and investors; and signed MOU for EIA Weyburn Storage and Monitoring Project. Phase II - incentive program design approved; number of signed contribution agreements; and number of tonnes of CO_2 stored.

★★★ – Housing - $33.6M

This program sub-sub-activity targets Canadian homeowners and homebuilders. The objective of the program is to promote and increase energy efficiency of new and existing housing in Canada. NRCan promotes the economic, health and environmental benefits of energy-efficient homes. Additionally, NRCan supports the implementation of energy-related retrofits as well as a reference baseline for new construction designs.

- Expected Result – Increased use of energy-efficient technologies in houses. / Perf. Ind. – Installation of energy-efficient technologies by builders.
- Expected Result – Energy savings in homes that undertake a post-retrofit and post-design EnerGuide for Houses evaluation. / Perf. Ind. – Identified energy savings in homes that undertake a post-retrofit and post-design EnerGuide for Houses evaluation.
- Expected Result – Increase in percentage of new housing at EGH80-R2000 level. / Perf. Ind. – Improvement in EGH Rating of new houses over time. Percentage of new housing at EGH80-R2000 level.

★★ – Buildings - $36.5M

This program sub-sub-activity targets Canadian builders, designers and organizations. The objective of the program is to accelerate the change in building design and construction practices and to encourage individual organizations to increase the energy efficiency of their operations, thereby contributing to the reduction of GHG emissions. NRCan promotes the economic and environmental benefits of energy-efficient construction. Additionally, NRCan encourages organizations in the commercial / institutional sector to increase energy efficiency in their operations, and provides incentives for the design of energy-efficient buildings.

- Expected Result – Improved average energy efficiency in retrofitted commercial / institutional buildings that have received financial incentives. / Perf. Ind. – Average energy efficiency improvement in retrofitted commercial/institutional buildings that have received financial incentives.
- Expected Result – Greater energy efficiency of Commercial Building Incentive Program (CBIP) buildings versus similar buildings built to the Model National Energy Code for Buildings (MNECB). / Perf. Ind. – Difference in energy efficiency of CBIP buildings versus similar buildings built to MNECB and difference versus the building stock.
- Expected Result – Energy savings from Energy Innovators Initiative incentive program. / Perf. Ind. – Energy savings attributable to EII incentive program.
- Expected Result – Increased use of energy-efficient technologies in buildings. / Perf. Ind. – Energy intensity in GJ/m2 of CBIP or EII buildings by building type compared to the building stock energy intensity by building type.

★★ – Equipment - $8.1M

This program sub-sub-activity targets Canadian consumers and manufacturers of energy-using equipment. Energy-efficiency regulations prohibit the imports of, or interprovincial trade in, prescribed products that fail to meet minimum energy performance and labeling requirements. The objective of the program is to gradually exclude the least efficient energy-using equipment from the market and to influence consumers to select, and manufacturers to produce, energy-efficient products that perform above the minimum standards. NRCan encourages consumers to purchase energy-efficient products and informs them of the energy-consumption implications of their equipment purchases. NRCan requires dealers to apply accurate EnerGuide labels to certain household products. In addition, NRCan promotes the most efficient energy-using equipment available by its endorsement of Energy Star qualified products.

- Expected Result – Improved average energy consumption of new equipment. / Perf. Ind. – Average energy consumption of new versus old appliances. Year-to-year improvement in energy consumption of new equipment.
- Expected Result – Accelerated stock turnover of less efficient equipment. / Perf. Ind. – Increase in stock retirement rate - average age of stock.
- Expected Result – Energy savings due to regulations. / Perf. Ind. – Estimated energy savings from regulations.

★★ – House in Order/Government Operations - $3.3M

This program sub-sub-activity targets federal government departments. The objective of the program is to improve energy use within the Government of Canada. Responsibility for achieving the federal greenhouse gas (GHG) reduction target of 31 percent below 1990 levels by 2010 is shared by 11departments. NRCan is taking a lead role in managing this task and is encouraging Government of Canada departments and agencies to improve energy use. NRCan is also facilitating comprehensive energy-efficiency upgrades and retrofits in government facilities. Additionally, NRCan supports partnerships with energy management firms, assists federal departments and agencies to decrease fuel use in vehicle fleets and purchases of energy-using products and aims to create a market for new technologies on the verge of becoming viable.

- Expected Result – Reductions in GHG intensity of federal vehicles. / Perf. Ind. – Higher use of E10 and alternative fuels. New E85 alternative fueling facilities. Number of hybrid and alternative fuel vehicles purchased for the federal fleet.
- Expected Result – Improvement in vehicle fuel efficiency amongst the federal fleet. / Perf. Ind. – Purchasing trends reflect move towards more cars than trucks and vans.
- Expected Result – Improvement of energy efficiency in federal buildings. / Perf. Ind. – Energy intensity improvements in federal buildings.
- Expected Result – Reductions in GHG emissions from federal facilities. / Perf. Ind. – GHG emissions reductions in federal facilities.

★★ – Industry - $5.9M

This program sub-sub-activity targets the Canadian industrial sector. The objective of the program is to encourage and facilitate action, both at the industry level and in individual companies. NRCan promotes energy efficiency and innovation through an industry-government collaborative initiative, the Canadian Industry Program for Energy Conservation (CIPEC), as well as on an individual company basis through the Industrial Energy Innovators Initiative. Additionally, NRCan attempts to improve the quality and availability of energy intensity data and the analytical framework for understanding and tracking industrial energy end-use.

- Expected Result – Improvement of aggregate energy intensity of CIPEC mining, manufacturing and construction industries leading to reduced GHG emissions. / Perf. Ind. – Aggregate energy intensity improvement of CIPEC mining, manufacturing and construction industries.
- Expected Result – Improvement of aggregate energy intensity of CIPEC energy-producing industries leading to reduced GHG emissions. / Perf. Ind. – Aggregate energy intensity improvement of CIPEC energy-producing industries.

★★ – Transportation - $51.1M
This program sub-sub-activity targets the Canadian vehicle market, individual drivers, and operators of commercial vehicle fleets. The objectives of the program are to improve the energy efficiency of new vehicles, to influence vehicle operations and vehicle maintenance and to support the use of alternative road transportation fuels. NRCan works to introduce more fuel-efficient vehicles into the Canadian market and to influence consumer demand for such vehicles, as well as provides information on fuel options. Additionally, NRCan supports driving training and awareness to ensure drivers understand the effect of driving behaviour, operation and maintenance practices. NRCan also provides operators of commercial and other non-Government of Canada vehicle road transportation fleets with information and assistance to help fleet managers improve operating practices and vehicle selection.

- Expected Result – Improvement in on-road fuel efficiency. / Perf. Ind. – Fuel saved from fuel saving devices. Fuel saved from the uptake of best practices (e.g. driving and maintenance behaviors). Fuel saved from the purchase of fuel-efficient vehicles.
- Expected Result – Expansion of ethanol fuel production and use in Canada by 2010. / Perf. Ind. – Volume of ethanol production.
- Expected Result – Improved fuel efficiency of new vehicles. / Perf. Ind. – Fuel efficiency of new vehicles.

★★ – Outreach - $18.4M
This program sub-sub-activity targets the Canadian general public. The objective of the program is to increase Canadians' awareness and understanding of climate change and the link to energy use, and to encourage Canadians to take action on climate change. NRCan provides information on energy efficiency and climate change and develops outreach initiatives that establish NRCan as a centre for energy efficiency knowledge and programs. Additionally, NRCan produces communications and marketing materials and operates a toll-free publications distribution service.

- Expected Result – Increased participation in Outreach activities. / Perf. Ind. – Percentage increase in participation in Outreach activities.
- Expected Result – Increased awareness and understanding of the need to take action on climate change. / Perf. Ind. – Percentage awareness and understanding of the need to take action.

S&T - Built environment - $22.6M
(see also the Knowledge, Innovation and Productivity priority for balance of actual spending for this sub-sub-activity) –

S&T - Power generation - $26.8M
(see also the Knowledge, Innovation and Productivity priority for balance of actual spending for this sub-sub-activity)

S&T - Transportation - $31.5M
(see also the Knowledge, Innovation and Productivity priority for balance of actual spending for this sub-sub-activity)

S&T - Conventional oil and gas - $4.4M
(see also the Knowledge, Innovation and Productivity priority for balance of actual spending for this sub-sub-activity)

S&T - Unconventional oil and gas - $13.1M
(see also the Knowledge, Innovation and Productivity priority for balance of actual spending for this sub-sub-activity)

S&T - Industrial sector - $34.5M
(see also the Knowledge, Innovation and Productivity priority for balance of actual spending for this sub-sub-activity)

★ – Large final emitters GHG reduction - $3.9M
The Large Final Emitters (LFE) sub-activity works with key industry sectors to establish reduction targets for greenhouse gas emissions. Through discussions with industry, provinces and territories, and other stakeholders, NRCan designs policies and legislative measures that are effective in encouraging reductions, are administratively efficient and clear, and help to maintain the competitiveness of Canadian industry.

- Expected Result – Development of the approach and the supporting legislative framework that will commit covered industrial sectors to reduce their GHG emissions for the first Kyoto commitment period (2008-12). / Perf. Ind. – Completion of the legislative package for presentation to Cabinet.

Expectations Not Yet Fully Met – see Section II, Energy program.

★★ – Low-level radioactive waste management (including Port Hope) - $9.4M
Management of the federal government's program for historic waste; low-level radioactive wastes that are not managed in an appropriate manner for the long-term and for which it has been determined that the owner can not reasonably be held responsible, including the provision of policy direction, funding, and oversight for the Low-Level Radioactive Waste Management Office (LLRWMO).

- Expected Result – Implementation of historic waste management strategies that meet health, safety, and environmental criteria in an economically and socially appropriate manner. In the case of the Port Hope area wastes, the result will be the cleanup of historic waste in the area, the remediation of local waste sites, and the consolidation of the material in new state-of-the-art long-term licensed waste management facilities./ Perf. Ind. – Complete the environmental assessment study reports for radioactive waste management projects being advanced through the Port Hope Area Initiative and begin the Government review of those reports, pursuant to the *Canadian Environmental Assessment Act.*

Departmental Priority – Public Safety and Security: $0.6M Actual Spending

★★★ – Energy infrastructure protection - $0.6M
This sub-sub-activity develops policies, legislation and regulations and to promote initiatives to strengthen the protection of Canada's critical energy infrastructure through close liaison with other federal departments, provincial governments, regulatory agencies, the energy industry and energy associations. It provides expert advice and direct program support to Public Safety and Emergency Preparedness Canada in formulating the National Critical Infrastructure Assurance Program. Development of the Business Continuity Plan for the Energy Program Activity also falls under this sub-sub activity. Internationally, this sub-sub-activity is engaged with the United States on issues related to cross-border energy infrastructure protection, information sharing and on other areas of interest. It represents NRCan in the Canada-U.S.-Mexico North American Energy Working Group to promote international cooperation and to exchange ideas on areas of mutual interest related to critical energy infrastructure protection and emergency preparedness.

- Expected Result – To increase the security posture of Canada's critical energy infrastructure, and in collaboration with the U.S., assess the vulnerability of cross-border energy infrastructure. / Perf. Ind. – Performance evaluations completed in 2005 and 2007.

Energy – Other Programs and Services

Other Programs and Services ($M)	Main Estimates	Actual Spending
Hibernia interest assistance	28.1	-
Statutory programs Atlantic	155.5	389.7
Program management and support	8.8	10.5
Sub-total	**192.4**	**400.2**
Corporate management	30.2	34.9
Total	**222.6**	**435.1**

Program Activity #3: Forest

Forest – Key Programs/Services

Departmental Priority – Knowledge, Innovation and Productivity: $39.5M Actual Spending

★★– Sustainable forest policy and stakeholders relations - $13.2M

This sub-sub-activity consists of initiatives related to: building relations and consultations with industries, government and non-government organizations; developing consensus and Canadian position on forest issues, implementing federal action plans in support of forest sector issues; providing support to the Canadian Council of Forest Ministers (CCFM), the National Forest Strategy Coalition (NFSC), National Advisory Boards on Forests (NABFOR), Forest Sector Advisory Council (FSAC) and Canadian Forest Innovation Council; developing Aboriginal and private woodlot policy, and strategic forest policy.

- Expected Result – Increased consensus among diverse stakeholders on Canadian position on forest issues. / Perf. Ind. – Development of geographically-based clusters consisting of forest-science research capabilities and expertise in support of innovation processes.
- Expected Result – Implementation of strategies and action plans in support of sustainable forest management. / Perf. Ind. – National, regional and local level partnerships, advisory bodies and/or councils supporting the forest sector. Forest-based communities engaged in public debates about forests. Progress in the implementation of Canada's National Forest Strategy (2003-08).

★★– Forest fire and management practices - $1.3M

This sub-sub-activity consists of research initiatives to improve Canada's understanding of the risks associated with forest fires; forest fire and wildfire management strategies; and developing options for planning and protecting forests and community resources. It involves the development and implementation of fire management decision support systems; understanding forest-climate interactions and large scale responses to climate change; and developing prediction models and information databases for public and professional access.

- Expected Result – Improved knowledge and understanding of the risks associated with forest fires and wildlife management, and options for planning and protecting Canada's forest and communities. / Perf. Ind. – Development and implementation of a new national wildfire strategy. Development of fire management decision-support systems, tools, prediction models and technologies.

★★– Native insects and diseases - $0.6M

This sub-sub-activity focus is on identifying and understanding the threats that native forest insects and diseases pose to the sustainability of Canada's forests..

- Expected Result – Improved hazards ratings of natural insects and diseases. / Perf. Ind. – Progress in understanding the dynamics and assessing the impacts of native forest insects and diseases.

★★– Alien invasive species - $0.6M

This sub-sub-activity centers on the identification and detection of alien invasive insects and fungi, and risk analyses.

- Expected Result – Improved methods to detect, identify, control, monitor, manage and report on alien invasive insects and fungi that impact on Canada's forests. / Perf. Ind. – Development of the forest component of a national invasive alien species strategy, in collaboration with members of the Canadian forest sector.

★★– Pest management - $12.6M

This sub-sub-activity centers on the understanding and modelling of pest population dynamics and in the development and use of environmentally safe pest control products and techniques.

- Expected Result – Improved knowledge and understanding of pest population dynamics and the use of sustainable forest management silviculture techniques. / Perf. Ind. – Progress in the development of environmentally sound pest management control strategies, tools and techniques.

★★ – Forest information synthesis and dissemination - $2.6M

This sub-sub-activity consists of developing and implementing national forest information systems for improved forest management decision-making. It involves: developing and implementing a national forest inventory system; developing forest management decision-support systems; and developing data collection methods.

- Expected Result – Increased knowledge on Canada's forests and forest sector. / Perf. Ind. – Development of national policy and S&T reports to Parliament, key forest stakeholders and the public.

★★ – Forest biotechnology - $5.0M

This sub-sub-activity consists of biotechnology to develop superior tree seedlings and mass propagation through single-cell cultures, transfer of technologies, the development of genetically improved trees that are more disease and pest resistant, assessment of potential environmental impacts from genetically modified species, and developing biotechnological alternatives to chemical pesticides.

- Expected Result – Improved knowledge and understanding of the impacts of forest biotechnology on Canada's forest health and wood supply. / Perf. Ind. – Development of pest and disease resistant trees; environmentally-safe alternatives to chemical pesticides and herbicides; assessments of the impacts of genetically modified trees on the environment.

★★ – Forest productivity - $3.6M

This sub-sub activity involves the development of support systems for forest management decision-making; measuring the effects of forest harvesting techniques; developing a relational database for assessing the impacts of disturbances on harvesting and stand productivity; and conducting timber and carbon yielding forecasts.

- Expected Result – Improved knowledge and understanding of forest ecosystem productivity and the dynamics that impact on harvesting and natural regeneration processes. / Perf. Ind. – Progress in the development of ecosystem-based forest information and management practices.

Departmental Priority - Trade and Investment: $28.0M Actual Spending

★★ – International forest leadership and protocols - $1.7M

This sub-sub-activity consists of promoting Canada's sustainable forest agenda within the international forest community and to level the trade playing field. It consists of developing/coordinating bilateral and multilateral forest sector agreements; providing international forest policy development and support for the advancement of a sustainable forest agenda at international fora; and advancing Canadian forest sector positions and commitments in international climate change negotiations and the Canadian Biodiversity Strategy.

- Expected Result – Achieving the Canadian Government's foreign-policy objectives while supporting achievement of its domestic forest policy objectives. / Perf. Ind. – Development, follow-up and monitoring of United Nations Forum on Forests (UNFF) activities and international conventions; bilateral and multi-lateral arrangements and agreements; processes and initiatives; and forest-related MOU's which secure and promote the interests of Canada's forest sector. Partnerships established with the international forest community and with developing/emerging forest countries. Integration of the *Forest Biodiversity Expanded Programme of Work* (FBEPW) as part of the forest sector's commitment to the Canadian Biodiversity Strategy.
- Expected Result – Compliance with the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol reporting requirements. / Perf. Ind. – Reporting requirements met through the development, refinement and use of Canada's *National Forest Carbon Monitoring, Accounting and Reporting System* (NFCMARS).
- Expected Result – Policy options aimed at mitigating climate change through forest related afforestation, reforestation, deforestation and forest management activities. / Perf. Ind. – Extent to which information and estimates on climate change are more precise, more defined and more complete relative to baseline information.
- Expected Result – Realize removals of atmospheric GHG emissions GHGs through the Forest 2020 Plantation Demonstration and Assessment Initiative. / Perf. Ind. – Full implementation of the Forest 2020 PDAI completed with atmospheric GHG removals as carbon is sequestered.

★★ – Competitiveness of Canada's forest sector - $26.3M

This sub-sub-activity relates to the development and implementation of programs and initiatives that enhance the competitiveness of Canada's forest sector and to prevent and/or address trade barriers being erected in traditional forest product markets. It involves developing and implementing market expansion programs, providing expert advice on forest products trade and disputes settlement; supporting Canada's three forest industry research institutes in primary and value-added research; conducting research and analyses on forest industry structure, trends, resource supply, and competitiveness; and developing markets for Canadian products in select foreign markets.

- Expected Result – Competitiveness of Canada's forest sector enhanced and maintained through trade promotion, market acceptance of Canada's forest products, and knowledge/information support in the resolution of trade disputes. / Perf. Ind. – Programs and initiatives that improve international market access for Canada's forest products and address the potential for non-tariff trade barriers being erected. Increased off-shore representation of Canadian industry associations delivering market development initiatives.

Departmental Priority – Energy and the Environment: $13.8M Actual Spending

★★ – Forest carbon modelling - $4.5M

This sub-sub-activity consists of developing and implementing processes and tools for measuring Canada's forest carbon; providing estimates of carbon sequestration; detecting change and forecasting the impacts of climate change. It involves: developing computerized tools for carbon stock measuring; capacity building, testing and reviewing the tools at model forest sites; and facilitating technology transfer to the larger forest management community across Canada.

- Expected Result – Knowledge/understanding of Canada's forest carbon stocks. / Perf. Ind. – Development and implementation of reporting processes and tools to measure, monitor and report Canada's forest carbon.

★★ – Impacts and adaptation - $2.0M

This sub-sub-activity consists of research initiatives to develop knowledge and improve Canada's understanding of the impacts of climate change on Canada's forests, their ability to adapt, and options for mitigating the effects. It involves: determining climate change stress factors; providing ozone information and modelling support for the Canada Wide Air Quality Model; assessing the relative importance of climatic, fuel, and topographical factors on forest fire occurrences; and developing models for tree improvement under changing climatic conditions.

- Expected Result – Improved knowledge and understanding of the forest's ability to resist and adapt to climate change in Canada. / Perf. Ind. – National climate change detection and prediction methodologies and models developed and implemented under various climate change scenarios. Assessments on the ability of forest species and ecosystems to resist, moderate, and / or recover from climate change related stressors in Canada.

★★ – Forestry practices - $5.2M

This sub-sub-activity consists of investigating the safe management and use of Canada's forests by advocating sustainable forest management practices that protect and preserve forest health and non-timber values and lead to increased efficiency and silviculture methods by forest managers.

- Expected Result – Increased knowledge, understanding and use of science-based evidence developed to support forest management decision-making. / Perf. Ind. – Development and make accessible to forest managers across Canada sustainable forestry practices, methodologies, tools and techniques in the protection of forests and forest watersheds.

★★ – Water/air quality - $0.5M

This sub-sub-activity consists of air and water quality research to determine the effects of human activities and other disturbances on indicator forest organisms and the environment. It involves: the development of guidelines and policies for the protection of water in forest watersheds; and monitoring of air quality impacts on forest health.

- Expected Result – Increased knowledge on the effects of human and natural disturbances on forest watersheds and the effects of air quality on forest health. / Perf. Ind. – Research information, policies and guidelines related to air and water quality to help offset the effects of human activities and other disturbances ono forest organisms and the environment. Development and make accessible to forest managers conservation strategies, methodologies, tools and techniques that address the impacts of natural and human disturbances on fores biodiversity.

★★ – Biodiversity monitoring and conservation strategies - $1.6M

This sub-sub-activity consists of studies examining the impacts of disturbances and forestry practices on biodiversity; the methods to evaluate and predict biodiversity; and the development of strategies for conserving biological diversity. It involves: capturing information on databases, developing prediction models, web-based diagnostic tools and transfer of technologies to stakeholders; and developing markers for selected tree species to identify genetic variations caused by natural and human disturbances.

- Expected Result – Increased knowledge on the impacts of forestry practices on biodiversity. / Perf. Ind. – Methods to determine the impacts of disturbances and forestry practices on biodiversity and the development of conservation strategies for biological diversity.

Departmental Priority – Northern and Aboriginals Communities: $14.9M Actual Spending

★★ – Sustainable forest management and urban, regional & international partnerships - $11.4M

In collaboration with participating partners, this sub-sub-activity consists of the programs and initiatives aimed at promoting sound sustainable forest management practices and involves: providing coordination and funding support to Canada's network of 11 model forests and assistance to international model forests; supporting on-the-ground demonstration projects; conducting knowledge transfer and outreach activities; and supporting urban forestry initiatives.

- Expected Result – Programs and initiatives to promote sustainable forest management practices in Canada and abroad using knowledge transfer, outreach activities and providing expert advisory support to stakeholders. / Perf. Ind. – Number/value of projects developed, implemented and transferred to forest managers under Canada's Model Forest Program. Number of communities developing and implementing innovative urban forest management practices. The degree to which the international forest agenda is shaped and/or influenced by Canada's concept of sustainable forest management.

★★ – First Nations/Aboriginal forestry capacity-building - $3.5M

This sub-sub-activity consists of programs and initiatives aimed at improving the Aboriginal capacity to participate in, and benefit from Canada's forestry opportunities. It involves: managing Canada's First Nations Forestry Program (FNFP); developing and implementing the Aboriginal Strategic Initiative under Canada's Model Forest Program including supporting the Waswanipi Cree Model Forest and Innu Labrador Project; governance support to the South Moresby Forest Replacement Account; and forest advisory support to Aboriginal treaty negotiations in British Columbia.

- Expected Result – Improved economic conditions and self-reliance in First Nations and other Aboriginal communities. / Perf. Ind. – Number/value of sustainable development projects requested and undertaken by First Nations and other Aboriginal peoples across Canada. Training/employment levels of First Nations peoples participating in sustainable development forest projects. Level of First Nations funding contributions in sustainable forest projects across Canada.

Forest – Other Programs and Services

Other Programs and Services ($M)	Main Estimates	Actual Spending
Social and economic research	0.8	3.4
Forest information systems and inventory	4.0	1.9
Forest health monitoring and reporting	2.3	0.7
Private woodlots	0.3	4.7
Management and support	29.1	45.9
Sub-total	**36.5**	**56.6**
Corporate management	13.2	15.3
Total	**49.7**	**71.9**

Program Activity #4: Minerals and Metals

Minerals and Metals – Key Programs/Services

Departmental Priority – Knowledge, Innovation and Productivity: $23.9M Actual Spending

★★ - Mining, processing and environmental research - $13.0M

This sub-sub-activity focuses on research and development in the following main areas of mining, processing, and related environmental issues: ground control; mine mechanization/automation; underground mine environment; metallurgical processing; mineralogy; mining effluents; tailings and waste rock; and metals in the environment. The sub-sub-activity's international reputation for technical excellence in conventional mineral processing is augmented by recognized leadership in developing technological solutions to reduce the environmental liabilities facing the minerals industry. Wherever possible, the sub-sub-activity works in partnership with industry, provincial/territorial governments, universities and other research institutes. Current activities focus on three principal strategic directions: promoting sustainable development by finding technically sound solutions to environmental problems; improving industry competitiveness through enhanced productivity; and improving health and safety in underground mining.

- Expected Result – The productivity and competitiveness of Canada's mining and processing industries are improved while environmental, health and safety impacts are reduced. / Perf. Ind. – Research is conducted in cooperation with industry. New targeted programs for deep mining and processing are developed and proposed.
- Expected Result – Developing countries benefit from Canadian expertise. / Perf. Ind. – Program activity experts are invited by the Canadian International Development Agency and other organizations to advise developing countries.
- Expected Result – Trade is facilitated by the establishment of standards to ensure accuracy and consistency in analytical determinations by mineral analysis laboratories worldwide. / Perf. Ind. – Laboratories worldwide continue to rely on these reference standards and certification of proficiency.

★★ – Advanced materials technology development - $10.9M

In collaboration with industry, this sub-sub-activity develops and deploys technologies that improve all aspects of producing and using value-added products derived from metals and minerals. Emphasis is placed on solving technological problems of relevance to NRCan's mandate in sustainable development, and on transferring materials technology to Canadian companies. It uses its specialists and one-of-a-kind laboratory facilities in metal processing and joining, corrosion prevention, ceramic and concrete technology, physical and mechanical testing, micro-characterization of materials, prototype fabrication, and advanced materials. The sub-sub-activity conducts research through five programs, each of which is led by a senior scientist with an extensive network of external contacts. The five research programs are: Infrastructure Reliability; Advanced Materials Processing; Advanced Concrete Technology; Sustainable Casting; and Efficient Metal Production. Additionally, the sub-sub-activity manages the Certification Program for Non-Destructive Testing (NDT) Personnel; administers tests and certifies non-destructive testing personnel for competence in various NDT evaluation techniques according to international criteria. Furthermore, by agreement between the Energy Sector and the Minerals and Metals Sector, the sub-sub-activity manages the Engineering and Technical Services group which designs, builds, operates, services and maintains equipment for use in research laboratories in both the Energy and Mineral and Metals Program Activity areas.

- Expected Result – Competitiveness and productivity are improved through the development of new materials and processes for the construction, transportation and energy sectors while greenhouse gas emissions are reduced. / Perf. Ind. – Targeted research is conducted in cooperation with industry, e.g., light metals research in cooperation with both Canadian and U.S. industry.
- Expected Result – Security and safety of pipelines are better ensured. / The Academic User Access Facility trains highly qualified personnel in Canadian universities.
- Expected Result – Developing countries benefit from Canadian expertise. / Perf. Ind. – Results of research are tested in cooperation with industry, for example, in relation to the Mackenzie Valley pipeline.
- Expected Result – Public safety is improved through the Canada-wide program to certify personnel who apply non-destructive methods (e.g., industrial radiography and ultrasonic technology) to analyse materials. / Perf. Ind. – Departmental experts are invited by the Canadian International Development Agency and other organizations to advise developing countries, e.g., on the use of fly ash in concrete in India.
- Expected Result – Contributions are made to international standards relating to materials performance and integrity. / Perf. Ind. – The number of personnel in Canada who are appropriately certified for non-destructive testing methods is maintained. Standards are accepted relating to offshore steel structures among others.

Departmental Priority - Trade and Investment: $3.6M Actual Spending

★★ - Economic and regional analysis - $0.8M

This sub-sub-activity promotes the international competitiveness of the Canadian minerals and metals industries, and a favorable investment climate for exploration and mine development in Canada. The Sub-Sub-Activity is responsible for developing and recommending federal financial and economic policies, providing detailed information and analysis to Canadian communities and potential investors in Canada and abroad, and providing advice and support to other federal departments in implementing policies and administering laws that affect the minerals and metals industries. The Sub-Sub-Activity is a major source of analysis and advice on a wide variety of topics including: all aspects of Canada's competitiveness in mining, and the economic and financial impacts of mineral development, and the raising of capital for exploration and mining. The Sub-Sub-Activity also conducts a wide range of seminars and participates in conferences in Canada and internationally to broadcast messages about the attractiveness of mining in Canada and the optimum conditions for economic and social development.

- Expected Result – Input to policy and economic decisions is provided at the regional and national levels. / Perf. Ind. – Decisions on transportation, investment, human resource, environmental and other policies as they pertain to the minerals and metals industries are influenced.

★★ - Tax and exploration - $0.1M

This sub-sub-activity promotes the international competitiveness of the Canadian minerals and metals industries and a favourable investment climate for mineral exploration and mine development in Canada. It is a major source of analysis and advice on the appropriate design of federal policies to achieve taxation and related goals. The sub-sub-activity is responsible for the collection or analysis of selected information on the Canadian minerals and metals industries describing ore reserves and for analysing exploration levels and trends. It provides technical interpretation of the federal *Income Tax Act* and *Excise Tax Act* as they relate to mining, and issues mineral resource certifications in compliance with the *Income Tax Act*. Finally, the sub-sub-activity leads federal-provincial/territorial-industry task forces in the analysis of the impact on Canada's mineral investment climate of changes in mineral taxation, and other policy areas.

- Expected Result – The tax aspects of the investment climate for mineral exploration and mining development are assessed and recommendations are made for improvements. / Perf. Ind. – The domestic investment climate for exploration and mine development is improved, as measured by average exploration expenditures in Canada. Analysis and statistics compiled by a federal/provincial partnership on Canadian exploration expenditures are published. New incentives are developed and proposed.
- Expected Result – The Minister's mandated responsibilities under the *Income Tax Act* and *Excise Tax Act* are discharged. / Perf. Ind. – Mining tax issues that arise under the *Income Tax Act* and the *Excise Tax Act* are resolved.

★★ - International liaison and trade relations - $1.0M

This sub-sub-activity formulates and implements strategies and initiatives to advance Canada's minerals and metals interests with other countries and international organizations. The Sub-Sub-Activity provides expertise and advice on life-cycle management for metals and minerals, and manages the domestic and international promotion and advancement of the Safe Use Principle for minerals and metals.

- Expected Result – International policy decisions as they pertain to strengthening Canada's minerals and metals industries are influenced. / Perf. Ind. – Canada establishes the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development. The international strategy on minerals and metals is developed.

★★- Industry and commodity market analysis - $0.7M

This sub-sub-activity conducts commodity, industry and market research, analysis and policy/program development with respect to metal and nonmetallic mineral industries. The Sub-Sub-Activity positions and recommends policies and actions on behalf of Canada in response to market access issues for Canada's minerals and metals industries and related products. The Sub-Sub-Activity provides advice to the Government of Canada on the performance of mineral and metal commodities and industries, and the sustainable development of mineral resources.

- Expected Result – Unnecessary restrictions on market access and investment are minimized or eliminated. / Perf. Ind. – Global commodity analyses in selected minerals and metals are produced. Cooperative efforts with the United States through an MOU are pursued. An MOU with the National Development and Reform Commission of the Government of China is signed to allow for discussions to minimize investment restrictions. An industry-NRCan market access committee is established.

★★ - Business development - $1.0M

In cooperation with other federal departments, Crown corporations, provincial governments, industry associations and companies, this sub-sub-activity guides initiatives for new business development. It arranges trade shows and trade and investment missions to help Canadian minerals and metals supply and service companies increase exports. The sub-sub-activity is also a source of analysis and advice on the economic and financial benefits of these trade shows and trade and investment missions to Canada, as well as the overall importance of minerals and metals supply and service companies to Canada's economy. The sub-sub-activity also promotes the recycling of end-of-life products, especially those containing minerals and metals.

- Expected Result – Canadian suppliers of equipment and services to the mining industry gain access to new markets and increase existing markets. / Perf. Ind. – The value of sales and transactions in progress, partly as a result of participation in trade shows, is increased. The return on investment by the Government of Canada in trade shows is also increased. A database of Canadian suppliers and a strategy are prepared.
- Expected Result – Policies and programs are developed to increase recycling of minerals and metals. / Perf. Ind. – A resource recovery and recycling strategy is developed.

Departmental Priority – Energy and the Environment: $0.7M Actual Spending

★★ - Environmental assessments and regulatory processes - $07.M

The environmental assessments and regulatory processes sub-sub-activity provides information and expertise for the development of domestic and international policies and regulations affecting minerals and metals; implements policies through its support of environmental and regulatory processes; and develops, administers and delivers programs and other minerals- and metals-related initiatives to meet the department's statutory obligations and government objectives. This sub-sub-activity is the unique and primary source of information and knowledge for the review and design of efficient and effective federal environmental legislation and regulations affecting minerals and metals. This includes having statutory responsibilities as a responsible authority for mining projects under the *Canadian Environmental Assessment Act* and related processes in the Northwest Territories, Yukon and Nunavut; providing policy advice in support of NRCan's role in the National Orphaned and Abandoned Mines Initiative; and leading the Minerals and Metals Program involvement in the five-year review of the *Canadian Environmental Protection Act* and regulatory reform activities under the Smart Regulations initiative.

- Expected Result – NRCan's obligation under the *Canadian Environmental Assessment Act* is met. / Perf. Ind. – Recommendations are accepted by mining companies to mitigate the negative environmental impacts of their mining projects.
- Expected Result – Environmental policies and regulations take into account the concerns of minerals and metals stakeholders. / Perf. Ind. – The program activity is invited to participate in bilateral and interdepartmental discussions, e.g., the *Canadian Environmental Protection Act*. The program activity ensures that the concerns of the mining industry are considered in the Government's Smart Regulations agenda.

Departmental Priority – Northern and Aboriginals Communities: $1.2M Actual Spending

★★ - Aboriginal affairs and sustainable communities - $1.2M

This sub-sub-activity promotes Aboriginal participation in exploration and mining activities in Canada, the use of mining as an economic activity to contribute to the development of sustainable communities, and partnerships between Aboriginal communities, the mining industry and governments. The Sub-Sub-Activity is responsible for the generation and dissemination of knowledge, information and tools for capacity building and sound decision-making in Aboriginal communities, and for working with Aboriginals to increase their understanding of mining and involvement in its component parts. The Sub-Sub-Activity is also responsible for promoting sustainable development of mining activities through development of information and initiatives aimed at ensuring that economic development during exploration and mining, and after closure of mines, is geared to developing sustainable communities. The Sub-Sub-Activity is also involved in promoting corporate social responsibility at the national and international levels, including working with other departments to promote international agreements such as the OECD Guidelines for Multinational Enterprises.

- Expected Result – Knowledge and understanding of the minerals and metals industries and their potential contribution to the well-being of Aboriginal communities are expanded. / Perf. Ind. – Aboriginal involvement in mining and related activities continues to rise. Information (e.g., toolkits) is delivered to Aboriginal communities. Economic, social and environmental data on Aboriginal communities in terms of the minerals and metals industries are obtained. An Aboriginal strategy with regard to the minerals and metals industries is developed for input to the government-wide Aboriginal initiative.

Departmental Priority – Public Safety and Security: $4.0M Actual Spending

★★ - Explosives regulations and permitting - $2.2M

This sub-sub-activity is responsible for administering Canada's *Explosives Act* and regulations. This is done through a national system of licenses and permits supported by a compliance inspection program. The importation, manufacture, storage, sale and some aspects of transportation by road of propellants, fireworks and other pyrotechnics in Canada are controlled under this program. The sub-sub-activity's principal thrust is public and worker safety throughout Canada. Other strategic thrusts include: delivery of easy-to-understand regulations in plain language; accessibility; consultation; security of explosives; and education.

- Expected Result – The *Explosives Act* and associated regulations to protect the safety and security of the public are effectively administered. / Perf. Ind. – Inspections, training, information distribution and certifications are delivered to mitigate the risk associated with explosives and fireworks.

★★ - Explosives science and technology - $1.8M

This sub-sub-activity comprises the Canadian Explosives Research Laboratory (CERL), Canada's national centre for the advancement of technology related to the manufacture, storage and transportation of explosives. It is the only Canadian facility of its kind for testing equipment for use in hazardous locations. CERL is accredited as a testing laboratory under ISO/IEC Guide 17025. CERL provides a variety of services to clients including: testing of explosives, fireworks, pyrotechnics and other energetic materials for classification and authorization under the *Explosives Act*; testing and certification of equipment for use in hazardous locations (explosive atmospheres); safety-related science and technology, such as the assessment of the hazards associated with energetic materials to improve process safety; and security-related science and technology such as new systems for blast mitigation, or improved methods for identifying and detecting explosives.

- Expected Result – The safety and security of workers and the public from the threat of explosives are improved through the development of new and modified technologies. / Perf. Ind. – The safety and security activities are of high quality and valued by stakeholders, as measured by: the impact of technical work on policy decisions; client feedback through formal surveys; the number of national and international standards contributed to through committees; and revenue from contracts with other government departments and external clients.

Minerals and Metals – Other Programs and Services

Other Programs and Services ($M)	Main Estimates	Actual Spending
Minerals and metals statistics collection and dissemination	2.6	2.4
Special projects and strategic priorities	0.5	0.5
Program management and support	4.7	13.8
Sub-Total	**7.8**	**16.7**
Corporate management	15.1	17.4
Total	**22.9**	**34.1**