

# Corporate Responsibility Report

## Summary



To read TransCanada's complete  
2005 Corporate Responsibility  
report, please visit our website  
at [www.transcanada.com](http://www.transcanada.com)

2005



**TransCanada**  
*In business to deliver*





# People

## Engaging our Stakeholders

TransCanada strives to develop and maintain positive relationships with our stakeholders.

Those stakeholders include our employees, customers, landowners, shareholders, regulators, the residents of communities where we operate, Aboriginal peoples, our industry peers, partners, contractors, educational and research institutions, members of the media, non-governmental organizations, and many others.

By treating these people respectfully, we build the foundation needed to attract and retain good employees, plan and develop new projects, and help to sustain broadly based community initiatives for positive social change.

There are four main ways we engage our stakeholders. These cut across all functions of the company and all geographical regions in which we operate. They are:

- consulting with stakeholders;
- providing a rewarding and respectful workplace;
- ensuring the well-being of our employees and others with whom we come into contact; and
- investing in the communities where we live and work.

In addition to conducting regular internal reviews of our approach to employee and stakeholder relations, safety and investment, we also seek guidance from independent, third-party organizations about best available practices.

To view key statistical measurements about our people performance, please visit our online Corporate Responsibility report. There you'll find statistics on our:

- People Profile
- Vehicle Incident Frequency
- Total Recordable Case Rates
- Away-from-work Case Rates
- Community Footprint by Province (U.S. and International included)
- Community Investment – Why We Contribute, How We Contribute, What We Support





## A Message from Hal Kvisle, President and CEO

The importance of corporate responsibility

At TransCanada, we have no higher corporate responsibility than to operate our energy infrastructure in a reliable, safe and cost-effective manner. We fulfill that obligation through operational excellence. This is part-and-parcel of maximizing the strength and value of our company.

To us, acting responsibly provides a distinct competitive advantage. It makes it easier for us to:

- enhance our relationships with all stakeholders;
- attract more customers and investment;
- recruit and retain the finest employees;
- strengthen our relationships with regulators;
- manage the risks inherent in a business like ours; and
- maintain our all-important license to operate.

This is nothing new for TransCanada. At our company, corporate responsibility rests on a well-defined and publicized set of values. We refer to these values as SPIRIT: Social Responsibility; Passion; Integrity, Trust and Respect; Results; Innovation; and Teamwork.

These values drive our decisions and guide our actions. Corporate responsibility at TransCanada is, in fact, nothing less than these values put into action by our dedicated employees.

In the years ahead, the integrated and sharply focused vision that makes TransCanada a responsible corporation will be more important than ever.

Issues such as the growing labour shortage, the rising cost of materials and the uncertain effects of new government policies mean we must continue to seek acceptable ways of dealing with escalating economic and social costs.

But most importantly, our attitude of corporate responsibility will allow us to address North America's infrastructure deficit in a proactive and sensible manner.

North America needs more energy transmission and electric power generating capacity to meet peak demands. Fortunately, our company is well equipped to address both deficits.

In doing so, TransCanada will continue to act from the deep sense of responsibility that our employees have always exhibited in their daily activities.

A handwritten signature in dark ink, appearing to read 'Hal', written in a cursive, stylized font.





# Environment

## Minimizing our Impact

As owner of one of the largest natural gas transmission systems in North America, and as a generator of significant electrical capacity, TransCanada works to minimize negative environmental impacts while upholding our responsibility to meet the strategic energy demands of the continent.

This can be challenging, as continental energy demand continues to grow in lock-step with greater regulatory oversight of environmental issues. As a result, we have defined and adopted a holistic, company-wide, risk-based approach.

Consisting of an integrated Health, Safety and Environment (HS&E) Management System framework and a continuous improvement cycle, the approach focuses on:

- managing greenhouse gas and air emissions;
- encouraging biodiversity;
- fostering energy efficiency; and
- participating in public policy discussions.

The framework is based on ISO 14001, an international standard for environmental management systems, and is used to capture, organize and document our company's commitment and expectations when it comes to managing our responsibilities. Our continuous improvement cycle contains 11 elements, or checkpoints, that complement the framework.

As always, we remain committed to following best industry practices as we continue to contribute positively to energy reliability and security across North America.

To view key statistical measurements about our environmental performance, please visit our online Corporate Responsibility report. There you'll find statistics on our:

- Green House Gas Emissions (2004/2005)
- Spills
- Environmental Non-compliance





# Business

## Managing for the Long Term

One of the most responsible acts any business can perform is to achieve financial stability over the long term.

When a company succeeds financially, it is able to make a significant contribution to the society in which it operates, and when a company acts responsibly, it is more likely to succeed. This reciprocity is at the heart of TransCanada's values and success.

We believe we have positioned ourselves well for long-term growth by embracing effective governance, by applying a risk-based economic model that maintains our competitive advantage and brings greater reward to our stakeholders, and by continually refining our corporate strategy.

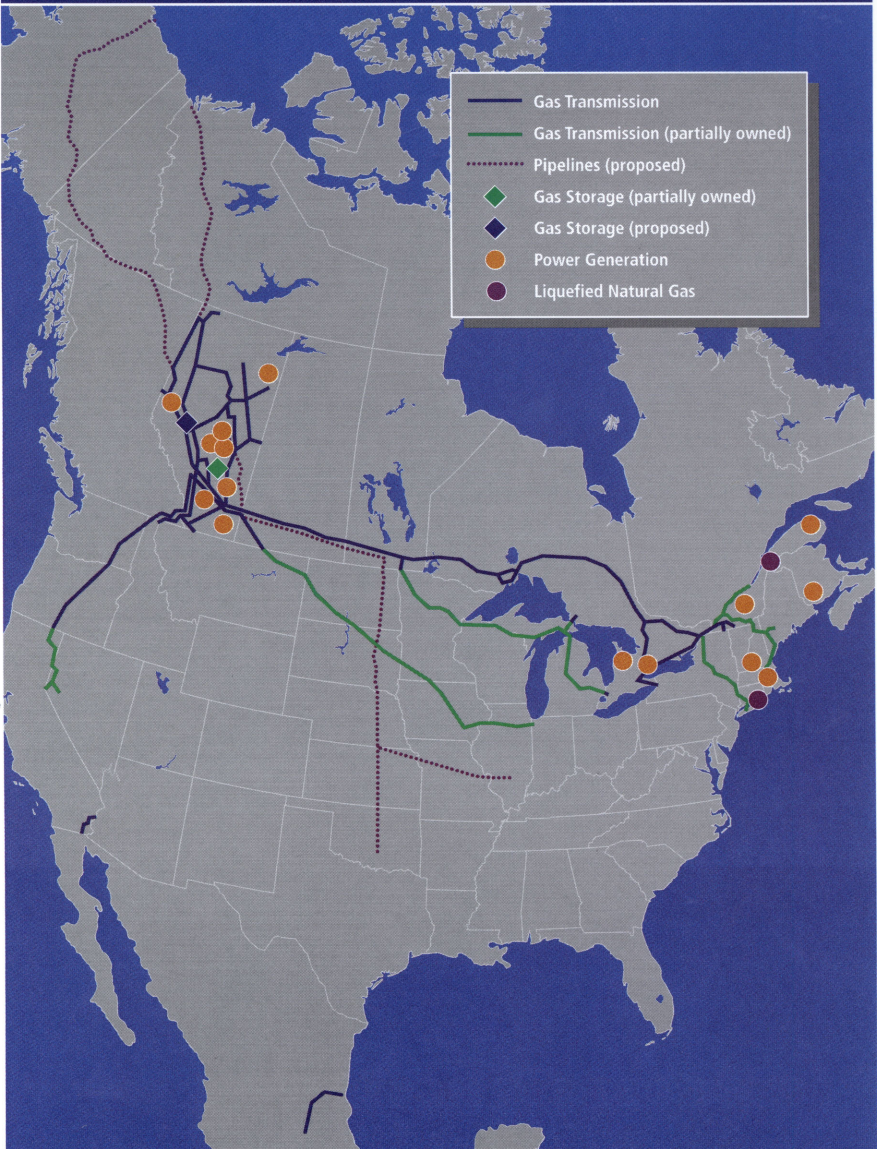
Within North America, the next challenge and opportunity for the energy sector is a serious infrastructure deficit. While reducing or eliminating that deficit will challenge the ingenuity of our industry as a whole, at TransCanada we are confident we have the resourcefulness and the will to make a significant contribution to resolving this issue.

**For more information about our business performance, please visit our online Annual Report at [www.transcanada.com](http://www.transcanada.com)**



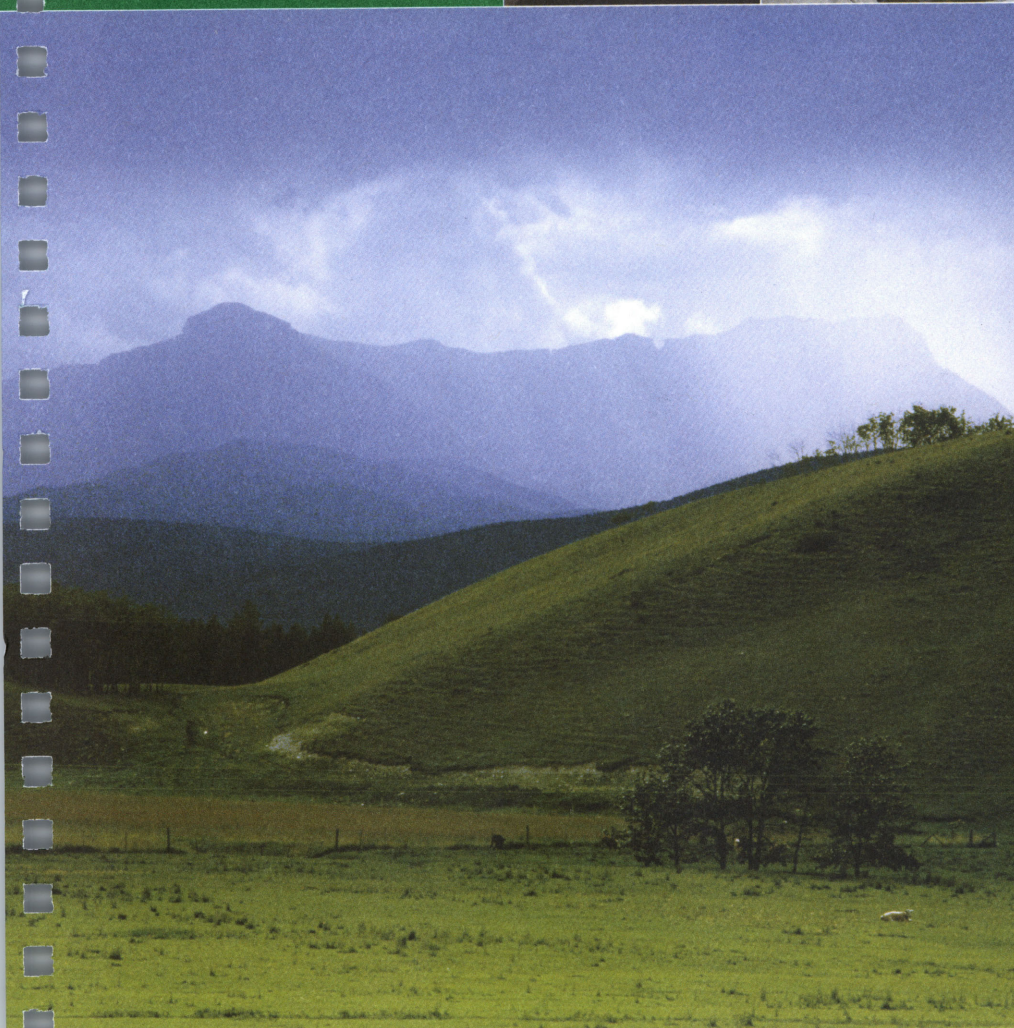
## TransCanada at a Glance

TransCanada is a leader in the responsible development and reliable operation of North American energy infrastructure. TransCanada's network of approximately 41,000 kilometres (25,600 miles) of pipeline transports the majority of Western Canada's natural gas production to key Canadian and U.S. markets. A growing independent power producer, TransCanada owns, or has interests in, approximately 7,700 megawatts of power generation in Canada and the United States.





2004 Social Responsibility  
Annual Report



listen  
learn  
respond



## INVESTING IN THE FUTURE

Since 1957, TransCanada has been in the business of moving energy resources. In recent years, the business has grown to include a comprehensive portfolio in power services.

Building, operating and maintaining natural gas pipeline systems, as well as power generation facilities, is a capital-intensive enterprise. Each year, TransCanada invests heavily in these physical assets.

As well as the investment in assets, TransCanada is an investor in corporate social responsibility: a portfolio of ethical and socially beneficial business practices rooted in our values.

These programs and policies reflect the company's commitment to the health and safety of our employees and contractors, to the well-being of the communities in which we operate and to the reduction of our impact on the environment.

TransCanada believes fundamentally that this is the right thing to do. In business terms, social responsibility is important to our day-to-day operations and long-term growth plans.

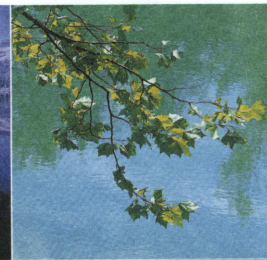
This publication takes you inside TransCanada's approach to corporate social responsibility, and introduces you to the people who deliver it and the communities that benefit from it.

From health and safety to community investment to Aboriginal relations to community consultation and the environment, TransCanada is investing in the future.

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HAL KVISLE  
President and CEO



## president's message



"We see safety and reliability of our facilities to be primary social responsibilities, and we take those responsibilities very seriously."



"At TransCanada, we believe natural gas and electric power are essential elements of modern North American society."

As a gas transmission and power generation company, we are responsible for the safe and reliable delivery of natural gas and electricity to millions of direct and indirect customers. We see safety and reliability to be primary social responsibilities, and we take those responsibilities very seriously.

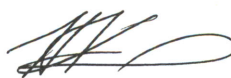
Natural gas and electric power are not discretionary commodities to most of our customers. People need our services when temperatures plunge across Canada and the northern United States. At TransCanada, we need to run our businesses well to ensure that essential services are always available, when and where our customers need them. I believe we fulfill that objective to a high standard.

As we perform our essential work in gas and power, the people of TransCanada see many opportunities to address broader societal needs.

This report documents TransCanada's approach to our social responsibilities, from environment to health and safety to community investment and consultation with individuals and communities impacted by our operations.

Gas pipelines and power plants are long-life facilities. We own and operate infrastructure that will, in many cases, be in service for more than 50 years. At TransCanada, we take a long-term view when making investments that will benefit both society and our shareholders. That is the nature of our business.

Our social contributions also tend to be long-term. We aim to build capacity and create opportunity, rather than solve short-term problems. We are looking down the road, investing in relationships and processes that will benefit society and our shareholders for decades to come.

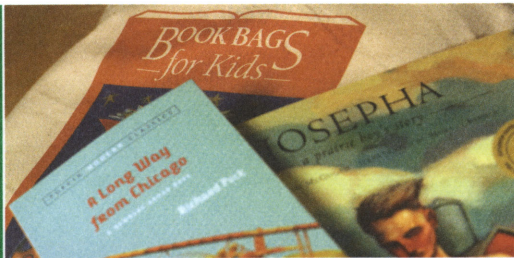


**HAL KVISLE**  
President and CEO



CHERYL BISHOP

Senior Community Investment Coordinator



community investment



"We're not just investing in communities,  
we're investing in people."

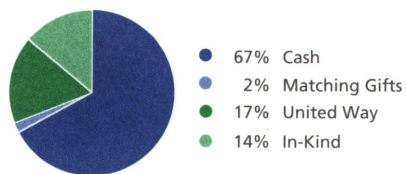


TransCanada's community investment strategy goes beyond putting dollars into communities where we live, work and do business. We develop meaningful partnerships with non-profit organizations that share our belief that learning is key to improving lives, increasing hope and creating new beginnings.

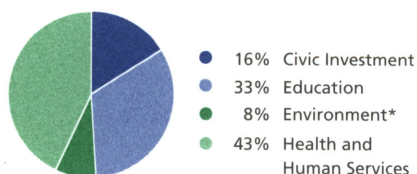
#### Five ways we invest

- 1 Financial support for not-for-profit organizations
- 2 Gifts in Kind, assisting not-for-profit organizations with surplus furniture, vehicles and computer equipment
- 3 United Way contributions – TransCanada partners with our employees to support a variety of community agencies across Canada
- 4 The Matching Gifts program, where the company matches employee and retiree personal contributions to charitable organizations dollar for dollar, up to a maximum of \$1,000 per employee per year
- 5 Employee volunteerism through community initiatives such as Habitat for Humanity

#### HOW WE CONTRIBUTE

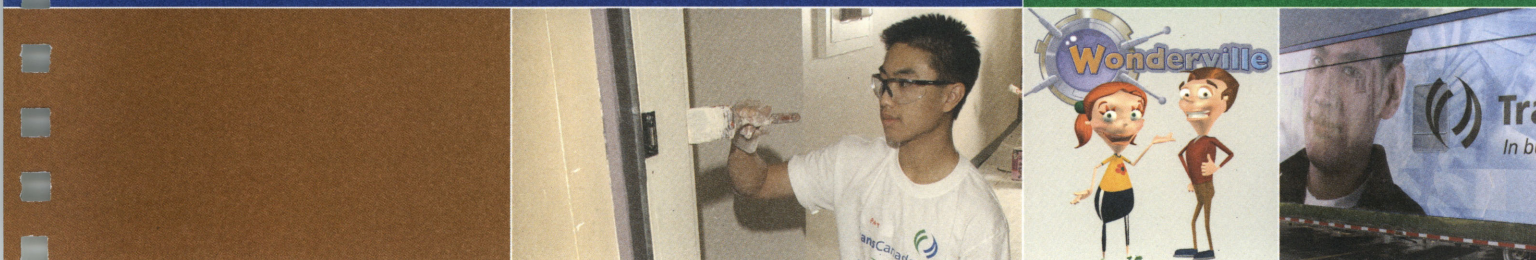


#### AND WHAT WE CONTRIBUTE TO



\* Environmental funding is also embedded in other focus areas





Getting results requires focused use of resources. For TransCanada, the focus is on education and lifelong learning within these four areas: education, health and human services, environment and civic investment.



For more information on Wonderville, go to [www.wonderville.ca](http://www.wonderville.ca)

#### TRANSCANADA AND THE UNITED WAY

When the United Way campaign rolls around each year, TransCanada employees get involved in a major way. Through a variety of fund-raising and volunteer activities, employees dedicate their personal time and make substantial personal donations to the campaign.

In 2004, TransCanada and its employees contributed \$1.6 million to United Way campaigns in Canada.

Sarah Raiss, TransCanada's Executive Vice-President, Corporate Services, served as Co-chair for the 2004 United Way of Calgary and Area campaign that raised the unprecedented amount of \$37.8 million.

Many TransCanada employees also serve as volunteers and board members for local United Way-supported social agencies, putting their professional expertise to work for a series of good causes. As a company, we're proud of these people and the difference they make in their local communities.

#### WONDERVILLE: SCIENCE EDUCATION FOR TODAY

As a forward-looking company, TransCanada enthusiastically supports science educational initiatives. One of the finest is Wonderville, an online learning site geared to children from Grades 4 to 6 developed by the Science Alberta Foundation. Located at [www.wonderville.ca](http://www.wonderville.ca), it combines interactive learning activities with fun animated features. The site exposes young students everywhere to the wonders of science.

#### NAIT MOBILE EDUCATION UNIT: TECHNICAL SKILLS ON THE MOVE

TransCanada is a key sponsor of NAIT in Motion, a mobile technical education unit developed by the Northern Alberta Institute of Technology (NAIT) in Edmonton. Two NAIT in Motion tractor-trailer units, each 53 feet in length and loaded with more than \$200,000 in equipment, bring technical courses directly to students in remote and northern Alberta communities. Fuelled by diesel generators and equipped with a 500-pound overhead crane, the units accommodate a variety of courses from welding and metalwork to pipe trades. By listening to the needs of these remote communities, we are better able to help them meet their educational goals.





TransCanada's community investment decisions reflect the broad geographic reach of TransCanada's business, the number of employees in a community requesting funding, and the number of people likely to benefit.

#### EMS FOUNDATION CAPSULE OF LIFE PROGRAM

Through a unique partnership with the Calgary Emergency Medical Services Foundation, TransCanada is making a difference in the lives of countless individuals, including seniors, a group traditionally under-served by many social service programs. By working together, more than 30,000 Capsules of Life will be offered to Calgarians, providing them with the comfort that their medical history will be easily accessible in an emergency situation.

Started in 1999, the Capsule of Life Program enables seniors, chronically ill people, those living alone and others to ensure medical information is available to emergency personnel, in cases where the person is unable to respond. A fridge magnet alerts EMS personnel to the presence of vital medical information in a plastic tube located in their fridge. Saving valuable time has been proven to save lives.

#### IN-KIND DONATIONS EXTEND LIFE OF EQUIPMENT

As a technologically advanced company, TransCanada utilizes a wide variety of equipment and other assets in various company operations.

Once these items are no longer required, we make every effort to find a good home for them. Most often, the equipment has many years of productive use in the hands of our community partners. In 2004, as part of TransCanada's ongoing upgrades to its Information Systems, we donated more than 500 desktop computers to deserving organizations across Canada.

In 2004, TransCanada's in-kind donations totalled more than \$700,000.





For more information on our Community Investment program, go to [www.transcanada.com/social/connections\\_investment.html](http://www.transcanada.com/social/connections_investment.html)

#### BOYS AND GIRLS CLUB

In 2004, TransCanada entered into a multi-year partnership with the Boys and Girls Club Community Services to support an innovative program, Learning In Our Neighbourhood (LION). The LION Bus program delivers mobile preschool programming in conjunction with parenting skills workshops in under-resourced communities in Calgary. By enhancing children's learning ability in the early years, and providing parents with tools to support their children's healthy development, this partnership supports lifelong learning, a focus area for TransCanada's community investment program.

Beyond financial support, in 2004 TransCanada employees supported various Boys and Girls Club programs through volunteer activities. With over eight Clubs and numerous programs being run in Calgary, an additional commitment was made to donate 50 office workstations to this organization.

#### RED RIVER COLLEGE – ELDERS IN RESIDENCE PROGRAM

For their post-secondary education, many students opt for the technical training available at community-based colleges. Given the technical skills shortage in evidence across the country, and TransCanada's need for technically skilled employees, this partnership was a natural fit for us. Winnipeg's Red River College has a large Aboriginal student population and we are pleased to support them through the Elders in Residence Program. The program offers students and staff access to an Elder providing essential spiritual and culture resource support.

This initiative is expected to improve both the recruitment and retention of Aboriginal students at the College as well as to break down barriers that would prevent students from reaching their potential.



### Why we invest

Working to enhance the quality of life in communities where we operate is important in human terms. It's also important to the long-term sustainability of our business operations. It's the right thing to do and it makes good business sense.

### SCIENCE AND CONSERVATION EDUCATION

Two of TransCanada's community investment priorities – education and the environment – are advanced through corporate support for The Canadian Peregrine Foundation.

For the past several years, TransCanada has proudly supported the Foundation's Project School Visit program. This unique initiative fosters stewardship of the environment and an awareness of conservation ethics.

The program is delivered to Ontario students in Grades 4 to 6 as part of the science curriculum. Biologists introduce students to a live peregrine falcon and talk about habitats, ecosystems and diversity of living things. The program gives students valuable first-hand experience with peregrine falcons, and an understanding of environmental and habitat issues that affect this species.

Participating birds are considered non-releasable and are an endangered species.

In 2003-2004, Project School Visit presented its program at 241 Ontario schools, also contributing printed resource materials and a video to the schools' libraries.

In addition to providing financial support to The Canadian Peregrine Foundation, TransCanada also donated a van that will allow for safe transport of "school visit" birds

across the province. By helping to ensure the birds' safety, the Foundation continues to educate the next generation about the importance of environmental stewardship.

### MATCHING GIFTS

Many TransCanada employees and retirees are involved in supporting various charitable organizations. The company applauds this spirit of giving, and encourages it through the Matching Gifts program.

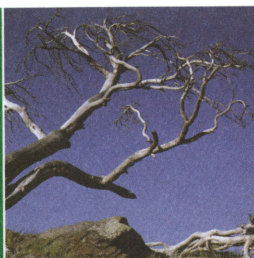
Through this program, TransCanada matches financial contributions made by employees and retirees to the charities of their choice. For every dollar they contribute, TransCanada matches that amount, up to an annual maximum of \$1,000 per person.

In 2004, TransCanada matched over \$120,000 in contributions made by employees and retirees.



**MIKE KNIGHT** (left)  
Manager, South Alberta  
and British Columbia Area

**LAWRENCE PACHAL** (right)  
Pipeline Technician



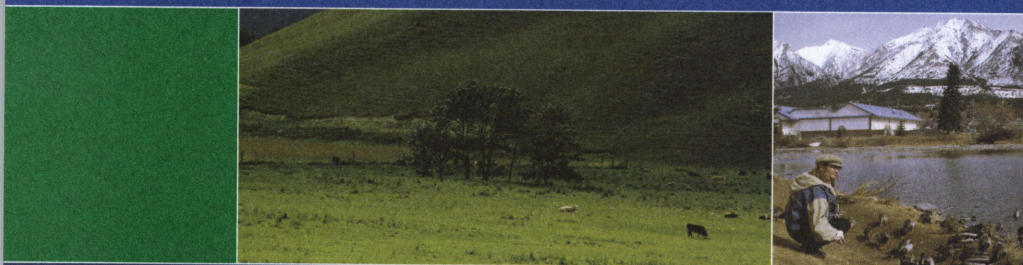
community consultation



"To us, the biggest bang for the buck comes when local people get to know local TransCanada employees. Good relationships mean we understand the community and they understand our business better."



By consulting regularly with directly impacted stakeholders and the broader public, TransCanada better understands the impact on our neighbours of our pipeline and power projects, and ongoing operations. This knowledge allows us to be the good neighbour we are committed to being.



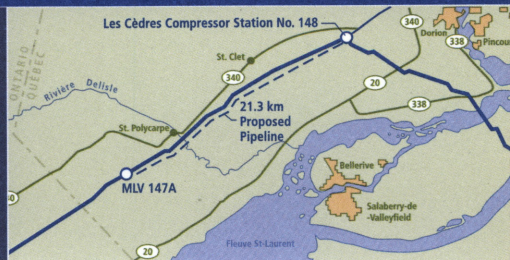
#### **Public consultation: an opportunity to learn**

We are proud of our commitment to ensure that impacted and interested stakeholders have an opportunity to learn about our proposed activities and provide valuable input to our project teams.

TransCanada recognizes meaningful consultation builds better projects. We believe that by consulting with stakeholders on our proposed activities, everyone involved, from landowners to community members to the project's engineers and system designers, have an opportunity to learn. Some of the ways TransCanada reaches out include:

- personal visits with landowners,
- public meetings and open houses,
- meetings with special interest groups and community leaders,
- advertisements in local newspapers, and
- distribution of notification packages and project brochures.





### Stakeholder relations matter

In addition to project-related community consultation, TransCanada works hard to maintain productive relationships with stakeholders impacted by our ongoing operations. TransCanada meets regularly with landowners and municipalities to address any issues and to ensure that the lines of communication remain open.

### LES CÈDRES PIPELINE PROJECT

The proposed Les Cèdres project provides a good example of TransCanada's public consultation process. TransCanada plans to parallel 21.3 kilometres of its existing pipeline west of Montreal in the Les Cèdres area with a 36-inch diameter pipeline. TransCanada is seeking project approvals from the National Energy Board and the Québec Ministry of Environment. These applications are being supported by comprehensive community consultation that began in 2004.

This effort included personal meetings with all impacted landowners and a series of meetings with area municipalities. As well as two public open houses, we held a landowner-specific meeting to communicate potential impacts to these stakeholders. Additionally, the project team advertised details of the project, and associated public consultation meetings, several times throughout the consultation period. Stakeholders received project information through mail-outs throughout this period as well.

Because this is an agricultural area, the region's landowners and community leaders sought assurances that agricultural drainage tiles would be safeguarded. TransCanada also sought input and provided information

on issues such as route selection, environmental mitigation measures, safety, and construction impacts.

Consultation for the proposed Les Cèdres pipeline project will continue in 2005. Pending approvals, construction is scheduled to begin in 2006 with the pipeline being in use later that year.

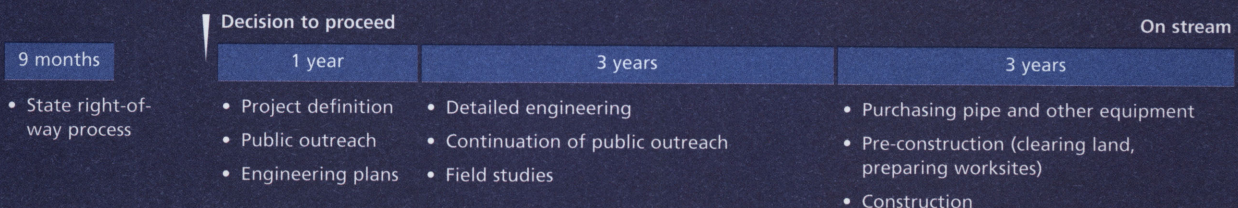
### INTEGRATED PUBLIC AWARENESS PROGRAM

Through our Integrated Public Awareness Program, TransCanada engages in consistent, ongoing communications with key community stakeholders such as landowners, municipalities, emergency service organizations and contractors.

The Program's objective is to inform key publics about TransCanada's facilities and activities in order to:

- protect the public from injury,
- protect or minimize effects on the environment,
- protect company facilities from third-party damage, and
- provide an opportunity for ongoing public awareness.





An excellent example of a public outreach program is TransCanada's activity in preparation for the Alaska Highway Pipeline Project.



For more information on the Alaska Highway Pipeline Project, go to [www.transcanada.com](http://www.transcanada.com)

#### BUILDING NORTHERN RELATIONSHIPS

In 2004, TransCanada launched a public outreach program in Alaska, in conjunction with the company's right-of-way application to the State of Alaska. The application relates to TransCanada's role in the Alaska Highway Pipeline Project, a proposed 745-mile (1,192-kilometre) pipeline within Alaska. The Alaska Highway Pipeline Project would move natural gas from Prudhoe Bay in northern Alaska to markets in the lower 48 states. Including pre-construction work, construction of the pipeline is expected to take three years and cost approximately \$6.8 billion.

The goal of TransCanada's outreach program was to provide and share information about the proposed pipeline project and answer questions from Alaska residents and community leaders regarding the application for the State right-of-way.

TransCanada conducted one-on-one meetings with stakeholders and key community leaders, and held six public information sessions in Delta Junction, Tok, Fairbanks, Anchorage, Northway Village, and Barrow.

Many of the residents' questions related to TransCanada's values and track record with the environment, and to the project's expected economic impact on Alaskan communities.

The 2004 program was strictly for the purposes of discussion of the right-of-way applications, and initial relationship building. If the project proceeds, extensive public outreach will continue throughout the life of the project.



Our activities provide significant economic benefits to communities in which we operate such as Williams Lake in British Columbia.



#### Fostering communication

TransCanada stays connected with public stakeholders through membership in a number of synergy groups with members that include industry, regulators, and the general public. It is the goal of these groups to foster communication between industry and impacted communities, and to promote win-win solutions for all stakeholders.

#### IN THE COMMUNITY

TransCanada operates the largest biomass power plant in North America, at Williams Lake, B.C. In 2004, the plant burned more than 680,000 tonnes of wood waste fuel, including treated and untreated wood waste purchased mainly from local lumber mills and wood product plants.

During 2004, TransCanada initiated a series of meetings with local employees, residents and community officials in Williams Lake to discuss the economic, environmental and social benefits of this unique power operation. Here are the highlights:

**Economic Benefits** The plant provides \$11.1 million in economic activity annually. Of this, \$9.5 million comes in the form of wages, biomass purchase, trucking, contract services and materials. A further \$1.2 million is accounted for by the plant's property taxes, which amount to 16 per cent of total property tax revenue for Williams Lake.

**Environmental Benefits** Thanks to the plant, there's been a significant reduction of fly ash

in Williams Lake, as well as lower particulate levels in the air. Since surplus treated and untreated wood is used to generate power, less of it goes into the regional landfill.

**Social Benefits** The Williams Lake plant supplies power to BC Hydro under a fixed contract that runs to 2018. The community benefits through the stability of 29 full-time jobs, plus the employment of three to four summer students every year. The community is further strengthened by 30 to 40 spin-off jobs and hundreds of out-of-town, business-related visits per year.

This community consultation effort also brought a significant return to TransCanada. With the perspective gained through consultation, the local business leaders and community officials have a much better appreciation for the plant's contribution to the City and local economy. In the spring of 2005, TransCanada was honoured to receive the B.C. Government's Minister of Forests Award of Excellence for the plant's contributions to the local economy and environment.





aboriginal relations  
and consultation



**ART CUNNINGHAM** (centre)  
Aboriginal Business Liaison

"I think TransCanada has been very proactive in changing with the times by building its corporate capacity to manage successful Aboriginal relations."





Across Canada, more than 150 Aboriginal communities are located within 50 kilometres of our pipeline and power facilities. We build relationships with impacted communities in the spirit of being a good neighbour and a desirable employer.

#### Principles guiding our Aboriginal policy

TransCanada strives to create short- and long-term employment opportunities for Aboriginal peoples impacted by our activities. We support learning opportunities for Aboriginal peoples with the objective of providing a well-trained source of Aboriginal employees and building capacity within Aboriginal communities.

#### ABORIGINAL COMMUNITY CONSULTATION

In February 2004, TransCanada and the Dene Tha' First Nation in Northwest Alberta signed a Community Cooperation Protocol Agreement, the fifth such agreement with Aboriginal communities in Canada.

This protocol governs how TransCanada will work with the Dene Tha' to build, operate and maintain facilities on traditional Dene Tha' lands. TransCanada's actions will be marked by cultural sensitivity toward these lands and strong environmental stewardship. This will help make possible the connection of TransCanada's facilities to a northern pipeline.

To build relationships and create mutual understanding, TransCanada employs a Liaison in each of its operating regions to work with local communities. These Liaisons develop local economic, educational and social opportunities with Aboriginal communities, and help earn community support for the company's plans and operations.

#### A SUPPORTIVE WORK ENVIRONMENT

TransCanada recognizes Aboriginal employment as an issue of vital mutual interest, matching the Aboriginal community's need for employment with industry's need for skilled and talented employees. To encourage recruitment and retention of Aboriginal employees, TransCanada has developed a range of programs and policies. These include:

- **Aboriginal Awareness Training** Since 2001, 200 TransCanada employees and contractors have participated in this three-module program, which is designed to increase awareness of Aboriginal history and culture and the benefits of working closely with Aboriginal communities.
- **Respectful Workplace Policies** A formal part of TransCanada's human resource management practices, these policies are intended to establish and maintain a working environment that is supportive for all people.
- **Support for Aboriginal Students** Over the years, TransCanada has provided millions of dollars for the education of Aboriginal students through scholarships to individuals and contributions to post-secondary institutions.





For more information on our Aboriginal Relations Program go to [www.transcanada.com/social/connections\\_aboriginal.html](http://www.transcanada.com/social/connections_aboriginal.html)

#### ABORIGINAL HUMAN RESOURCES STRATEGY

TransCanada's Aboriginal Relations and Human Resources teams, with guidance and input from the company's Aboriginal Ambassador Team, developed a comprehensive Aboriginal Human Resources Strategy in 2004.

This Strategy recognizes that Aboriginal youth are an essential source of future employee talent. It takes a long-term approach to increasing Aboriginal employment accessibility, while maintaining a respectful and supportive workplace.

The Strategy is now a formal part of TransCanada's overall human resources planning process.

Throughout 2005, the Strategy will be implemented with the ongoing assistance of the Aboriginal Ambassador Team. Members of the team will provide a crucial perspective on its implementation across the country.

#### ABOUT THE ABORIGINAL AMBASSADOR TEAM

To advance the Aboriginal Human Resources Strategy, TransCanada established an Aboriginal Ambassador Team. This diverse team consists of members from different areas of the company. This group shares a common vision of maintaining a workplace environment that is aware and accepting of Aboriginal cultures and employees. Together, they make recommendations on human resources policies and keep other employees informed about Strategy progress.

#### SUPPORTING ABORIGINAL BUSINESSES AND EMPLOYMENT

TransCanada is working to help enhance the economic capacity of our neighbours by hiring Aboriginal contractors for maintenance and construction activities at our facilities from Ontario to British Columbia.

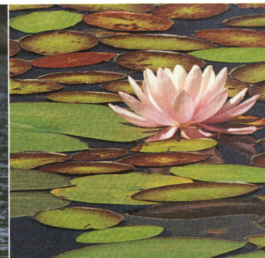
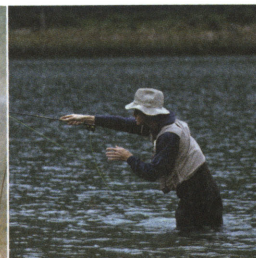
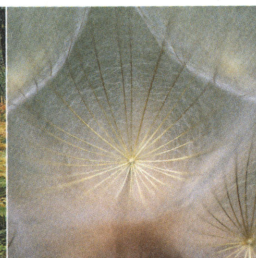
To support Aboriginal businesses, we increased the amount spent on services they provide by 34 per cent in 2004 compared with 2003. That brings our total expenditure on Aboriginal contracting in 2004 to more than \$5.5 million.

TransCanada achieves this by:

- Contracting work with Aboriginal-owned companies,
- Providing Aboriginal subcontractors with opportunities to work with our prime contractors, and
- Encouraging our prime contractors to provide Aboriginal employment.



HASAN IMRAN

Senior Environmental Advisor,  
Climate Change

environment



"TransCanada has one of the best methane emissions management programs in North America. When you compare our emissions to previous years, it's clear we're doing our part, and more, on the issue of climate change."



TransCanada's Environmental Principles provide a consistent, company-wide framework for making decisions and conducting activities to reduce our impact on the environment. That's important since everyone in the company makes decisions that affect the environment in ways big and small.

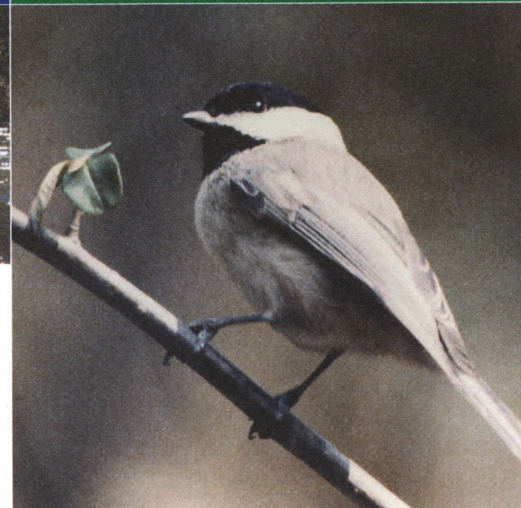
#### Five ways we protect the environment

- 1 A company-wide environmental management system
- 2 A dedicated team of project managers and environmental scientists, with expertise in, and passion for, the environment
- 3 Activities supporting conservation of fish and wildlife and their habitats
- 4 Active involvement and leadership in multi-stakeholder groups relating to the environment
- 5 An industry-leading program for the monitoring and reduction of greenhouse gas emissions





Photo: Canadian Wildlife Service  
Photographer: B.D. Cottrille



TransCanada selects and funds environmental projects based on their connection to the company's business activities. Since much of TransCanada's work takes place in forested areas, wildlife and habitat conservation are a focus.

#### **Site assessment, remediation and monitoring**

TransCanada uses a risk-based method to determine how existing sites can best be assessed, remediated and monitored. Our process often involves public and regulatory consultations to create mutually satisfactory results.

#### **ENVIRONMENTAL MANAGEMENT**

TransCanada pursues a model of continuous scrutiny of our environmental management practices and is always looking for ways to do business with less impact.

Working closely with leading environmental consultants, our Environmental Management Team is constantly exploring ways to conserve and reclaim habitat, and create conditions where wildlife can thrive throughout the areas near our 41,000-kilometre natural gas pipeline system. This includes supporting significant ongoing research into grizzly and woodland caribou habitats.

#### **PROTECTING MIGRATORY BIRDS**

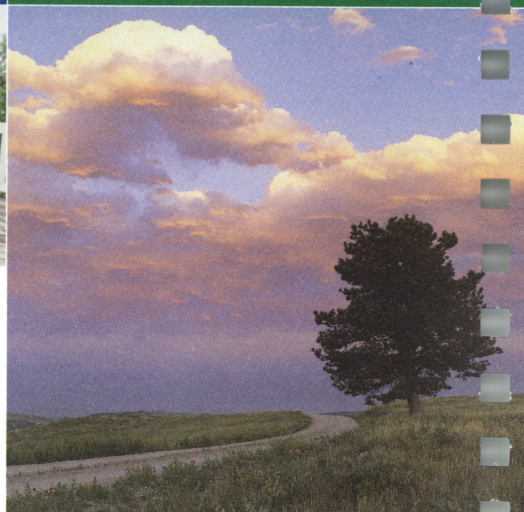
TransCanada is the industry co-chair of the Canadian Pipeline Environment Committee (CPEC), a multi-stakeholder group of industry and government representatives with an interest in sound environmental management of pipelines in Canada. As one of its primary projects for 2004, CPEC has developed information resources to help pipeline companies protect migratory birds and their habitat in the vicinity of pipelines.

#### **DIGITAL ATLAS HELPS DEVELOPERS TAKE CARE**

With the right kind of information, land developers can do a better job of safeguarding significant natural environments.

Thanks to a digital atlas of the Northwest Territories – a project of the World Wildlife Fund that received support from TransCanada – now they have it. The atlas identifies key environmental features in sensitive areas, giving developers valuable insight into where to locate and how to build future developments.





The intensity of greenhouse gas emissions from our three major pipeline systems has dropped by approximately 50 to 60 per cent since 1990.



For more information on our Climate Change Strategy, go to [www.transcanada.com/social/environment\\_climate.html](http://www.transcanada.com/social/environment_climate.html)

#### MANAGEMENT OF GREENHOUSE GASES AND NITROGEN OXIDES

At TransCanada, we believe the natural gas we transport and the electricity we generate play a critical role in meeting continental energy demand. We recognize, however, that our facilities produce emissions that can contribute to air-related issues. For this reason, management of air emissions and climate change issues are key areas of our environmental stewardship work.

#### GREENHOUSE GASES

As with other areas of environmental management, what you do matters a lot more than what you say. Over the past several years, TransCanada has invested millions of dollars in understanding, measuring and managing greenhouse gas emissions generated by our operations. We have implemented industry-leading

programs such as our Fugitive Emissions Management Program that have allowed us to identify and repair leaks on our pipeline systems through a Leak Detection and Repair Program (LDAR).

In 2004 alone, TransCanada's efforts through its LDAR Program saved 325 million cubic feet of natural gas, equivalent to:

- 166,000 trees planted,
- 33,000 cars taken off the road, or
- 2,150 homes heated and supplied with hot water.

Overall, the greenhouse gas emissions intensity of our three major pipeline systems has dropped by approximately 50 to 60 per cent since 1990. This intensity reduction (that is, reduction in amount of greenhouse gas emissions that are released when moving one billion cubic metres of natural





gas over one kilometre) is a result of the installation of higher efficiency compressor engines and implementation of methane management programs as well as reduced system throughput.

TransCanada uses highly efficient processes to generate electricity. A number of our power generation facilities conserve fuel by using waste heat from our gas turbine generators to produce steam. In 2004, the 165-megawatt MacKay River cogeneration plant came onstream. This natural gas-burning facility provides electricity and steam to an in-situ oilsands plant near Fort McMurray, Alberta at 75 per cent fuel efficiency, approximately twice the level of conventional combustion turbines.

TransCanada also operates two biomass generators in which more than 900,000 tonnes of forestry byproducts are burned to produce electricity. The process is considered carbon-neutral and the facilities use the latest electrostatic precipitator technology to reduce particulate matter produced in the process.

#### NO<sub>x</sub> EMISSIONS

The combustion of natural gas at our power and compression stations produces nitrogen oxide (NO<sub>x</sub>) emissions that contribute to air quality and acid rain concerns. TransCanada uses a combination of methods to meet NO<sub>x</sub> limits established by legislation or by operating permits for our facilities. These include:

- using front-end technologies designed to prevent the formation of NO<sub>x</sub>, such as Dry Low NO<sub>x</sub> or Dry Low Emissions engines,
- trading or purchasing NO<sub>x</sub> emission allowances and credits in regions that have implemented cap and trade programs, and
- avoiding or minimizing NO<sub>x</sub> formation through our choice of process for generating electricity (such as cogeneration).

While absolute levels of NO<sub>x</sub> from our facilities have risen due to the increased amount of gas being shipped and increased power generation, the intensity of emission levels in newer power facilities has been reduced by 75 per cent in the last decade.



### Environmental stewardship

Environmental performance is central to TransCanada's long-term business strategy. We believe that financial performance is enhanced by our strategic investments in environmental stewardship. Similarly, every step we take to sustain the environment sustains the company's future, as well. There's no need to choose between corporate and environmental performance. You *can* do both, and we are.



For more information on our Environment Programs, go to [www.transcanada.com/social/environment\\_climate.html](http://www.transcanada.com/social/environment_climate.html)

### BIOSTABILIZATION WORK AT STREAM CROSSINGS

In 2004, TransCanada's Environmental Management Team began a study to evaluate past projects where a variety of plant materials and reclamation methods were used to stabilize stream banks at pipeline water crossings.

During their fieldwork, TransCanada workers and a consulting firm gathered performance data from 20 pipeline stream-crossing sites in Alberta that were installed in the 1990s. In addition to stabilizing stream banks, the sites played the key role of providing overhanging vegetation cover for fish and other stream life. Both materials and stabilization techniques were observed and evaluated.

In 2005, the group will produce a report that outlines which biostabilization techniques work best under certain environmental conditions, at which times of year.

TransCanada workers will have this information available for the 2005 field season, allowing them to make informed decisions about biostabilization techniques and materials. This, in turn, should improve the habitat recovery at and near these streams.

It's another example of how a simple investment of time and money can pay substantial and almost immediate dividends.

### WILDLIFE PROGRAM: APPLIED RESEARCH

Our Wildlife Program is built on partnerships with advocates and researchers, including:

- **The Boreal Caribou Committee (BCC)**

The BCC researches the impacts of industrial development on woodland caribou, a threatened species in Alberta, and develops guidelines to conserve caribou and their habitat. It's TransCanada's policy to reclaim our right-of-way quickly after pipeline construction, to minimize our impact on caribou populations.

- **The Northern Watershed Project**

This multi-stakeholder research initiative, started in 1999 by the Alberta Conservation Association, is helping government and industry understand how manmade disturbances impact forests and fish in northwestern Alberta. With this knowledge, we can develop effective management strategies for repairing forested areas.

- **Foothills Model Forest Project**

Researchers and specialists are working together to better understand how grizzly bears use their habitat and respond to changing landscapes. This initiative has contributed to TransCanada's efforts to manage human access to our rights-of-way to achieve minimal environmental impact.



ALISON SCHMIDT  
Senior Health and Safety Advisor



health and safety



"At TransCanada, we believe that health and safety incidents are predictable and preventable. Our goal is to have an incident-free workplace."



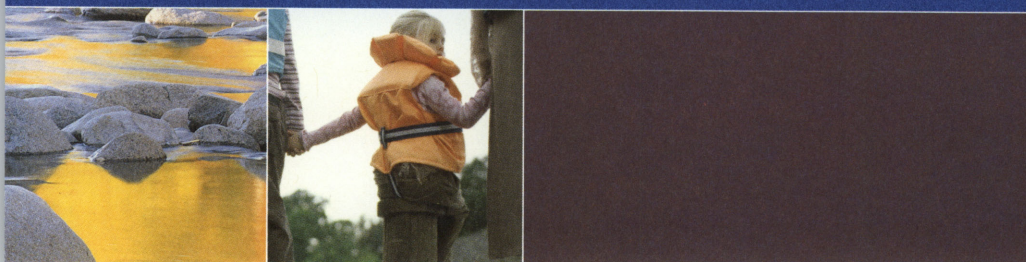
The safety of TransCanada's employees and contractors is always top of mind. The company is committed to having the best safety practices in all aspects of its business.

**Safety – 24 hours a day, seven days a week**

TransCanada's Safety 24/7 program is designed to increase awareness and promote safe behaviours at work, at home and at play. Because a large number of incidents occur away from work, the company encourages people to take a safety-first attitude home with them. The program is increasing awareness of health and safety hazards in the home and community, and helping to mitigate them. For example, in 2004 employees and their families were given access on their home computers to the Safety 24/7 website via the TransCanada portal. The website provides a library of up-to-date and relevant safety information. Our motto: "Because safety matters – all day, everyday."

**Five ways we prevent incidents**

- 1 Technical training
- 2 Role descriptions and accountabilities
- 3 Pre-activity planning
- 4 Site-specific risk assessment
- 5 Obligation to "speak out" about safety







TransCanada has a top-tier health and safety program, which is demonstrated through our strong performance.

#### Improving on an excellent record

We are always seeking to improve our strong safety performance. For 2005, TransCanada is focusing on three major initiatives. The first addresses the crucial issue of interdependent behaviours and actions in preventing workplace incidents. The second is a continuation of the contractor management program that delivered good results in 2004. A third initiative is the development and implementation of a soft-tissue injury reduction program.

#### SAFETY IS ATTITUDE

For TransCanada, safety is a core business strategy that is supported by:

- The establishment of aggressive performance targets.
- Monthly monitoring, measuring and reporting on those targets.
- Committees at many levels within the organization dedicated to health and safety, including the Health, Safety and Environment (HS&E) Committee of the Board of Directors, the TransCanada Management HS&E committee, and

Joint Health, Safety and Environment committees at the employee level.

- Several programs designed to identify, assess, and mitigate occupational health and safety risks, including Job Safety Analysis, pre-job meetings, safety inspections and safety audits.

While TransCanada has strong occupational health and safety programs and performance, we continue to plan for further improvements.

The chart below shows how we compare with our industry peers in safety performance.

#### 2004 Health and Safety Performance Summary

	Total Recordable Case Rate*	Away from Work Case Rate**	Vehicle Incident Frequency Rate***
TransCanada	1.19	0.33	2.88
Canadian Energy Pipeline Association average	1.64	0.49	5.87
Canadian Gas Association average	4.31	1.11	3.82

\* Cases where medical aid is required

\*\* Where employees could not work because of an occupational injury or illness

\*\*\* Number of recordable vehicle incidents related to a common exposure base of 1,000,000 kilometres driven





For more information on Employee Health and Safety, go to [www.transcanada.com/social/health.html](http://www.transcanada.com/social/health.html)

#### 2004 EMPLOYEE SAFETY PERFORMANCE HIGHLIGHTS

- The number of recordable cases where medical aid was required was reduced by 17 per cent in 2004 compared with 2003.
- Employees incurred a medical-aid incident every 168,000 hours worked in 2004 compared with every 143,000 hours in 2003.
- The number of away-from-work cases where employees could not work because of an occupational injury or illness was reduced by 22 per cent in 2004 compared with the previous year.
- Employees incurred an away-from-work incident every 600,000 hours worked in 2004 compared with every 478,000 hours in 2003.
- The total number of away-from-work days was reduced by 74 per cent in 2004 compared with 2003.
- Employees were away from work for 165 days in 2004 compared with 684 days in 2003.

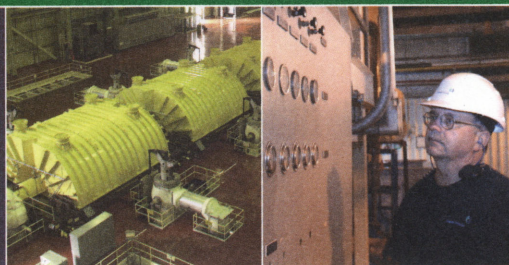
#### CONTRACTOR SAFETY MANAGEMENT

Every year, TransCanada hires contractors who work almost two million person hours. They provide a wide range of essential services from low-risk janitorial work to higher-risk construction and demolition assignments.

To be eligible for contracts with TransCanada, contractors must share our commitment to safety and be capable of executing best-of-class health and safety practices.

In 2004, TransCanada enhanced its Contractor Safety Management Program. The program outlines requirements to effectively manage contractors who work for TransCanada from the prequalification stage to a post-construction review.





### CONTRACTORS ACHIEVE EXCELLENT HEALTH AND SAFETY RECORD

In 2004, TransCanada contractors performed exceedingly well in the health and safety area, reporting only 22 injuries, of which two resulted in time lost at work. The resulting away-from-work case rate was one-fifteenth of the Alberta construction industry rate and one-tenth of the Ontario construction industry rate.

### GRANDVIEW AND BÉCANCOUR CONSTRUCTION PROJECTS

TransCanada contractors achieved an exceptional safety record during 2004 on both our power plant construction projects at Grandview, New Brunswick and Bécancour, Québec.

By mid-November 2004, more than 290,000 hours of construction work had been completed at the Grandview Cogeneration Plant without a single recordable or lost-time case. The 90-megawatt plant is now in operation.

In the same time period, more than 72,000 hours were worked at the Bécancour, construction project without a recordable or lost-time case. The 550-megawatt plant, which is on schedule and on budget, is expected to begin operations in 2006.

### TRANSCANADA'S COMMITMENT TO FACILITY SAFETY AND RELIABILITY

TransCanada is expanding its portfolio of pipeline and power assets through construction of new facilities and strategic acquisitions from other players.

In both cases, the company's health and safety professionals ensure that all aspects of the operation meet or exceed regulatory standards and TransCanada's own standards for health and safety performance.

When building new facilities, health and safety requirements are an integral part of design, construction and testing. When acquiring, TransCanada conducts a thorough review of historical practices and current assets and determines which areas, if any, require upgrading.

In recent years, TransCanada has brought a number of new and newly acquired facilities into its health and safety management system.





As a growing North American energy company, TransCanada is committed to ensuring that all assets and facilities meet the same high level of health and safety performance.

#### Operating reliability

- We improved operating reliability of our pipeline business by seven per cent compared to 2003.
- There were no pipeline ruptures on TransCanada-operated systems in 2004. Volume interruptions were down 45 per cent in 2004 compared to 2003.
- Power plant availability averaged 96 per cent, well above the industry rate of 90 per cent. Forced outage rate averaged 1.6 per cent compared to the industry rate of five per cent.

#### PIPELINE AND POWER MAINTENANCE

TransCanada's network of natural gas pipeline spans 25,600 miles (41,000 kilometres). Power facilities we own, control or are building generate more than 5,700 megawatts of power – enough to meet the needs of 5.7 million average households.

With numbers and responsibilities like these, the task of maintenance for performance and safety never ends. All pipelines in TransCanada's system receive annual maintenance according to the latest industry codes and standards. Pipelines that are of a higher risk, such as in populated areas, are subject to increased pipeline maintenance dictated by a detailed hazard review that is performed annually on every metre of pipe in the system.

TransCanada's workplaces are subjected to a continuous, systematic and comprehensive process to identify and eliminate health and safety hazards.

The experience and dedication of our inspection and maintenance teams are vital assets. So are technological innovations such as the Geographic Information System that allows TransCanada engineers to perform state-of-the-art risk assessment and

employees to access pipeline data, maps and imagery. This gives staff a better way to know where to repair.

In another example, we use internal pipeline inspection tools to scan pipe for signs of corrosion or other defects, allowing field crews to perform any necessary preventive repairs to the pipeline.

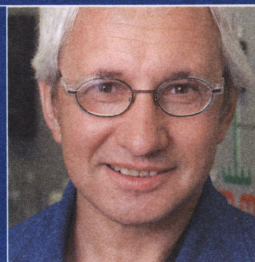
#### CANCARB ACHIEVES INDUSTRY FIRST

In 2004, TransCanada's Cancarb facility in Medicine Hat, Alberta became the first carbon black operation in North America to receive three certifications for its quality, environmental, and health and safety management systems from the Canadian General Standards Board. In December, Cancarb received the ISO 9001, ISO 14001 and OHSAS 18001 certifications.

Cancarb is the world's largest manufacturer of thermal carbon black with customers on six continents. The facility is 100 per cent owned by TransCanada and operates a power plant that uses waste heat from the carbon black process to produce about 26 megawatts of electricity for sale to the City of Medicine Hat.



## our values



TransCanada is committed to the highest standards of business integrity, a value which leads directly to our responsibility to communities, health and safety and the environment.

**Our Values: SPIRIT**

The word SPIRIT neatly captures the values of TransCanada in a way that everyone can remember and understand.

**Social Responsibility:** to our employees, the communities we serve and the environment

**Passion:** we are highly engaged in the company's values and success

**Integrity, Trust and Respect:** we are always responsible and accountable for what we do

**Results:** a commitment to deliver exceptional returns to shareholders

**Innovation:** we always seek new and better ways to meet our customers' needs

**Teamwork:** we work together to get results, while respecting our differences

**CODE OF BUSINESS ETHICS**

TransCanada has a Code of Business Ethics (COBE) that details the high level of business conduct expected of every employee in the company. The company's corporate governance process requires every employee to annually read COBE and formally certify their understanding of these standards and their commitment to comply.

Employees are encouraged to discuss ethical issues with their supervisor, seek clarification from management or confidentially consult the company's Ethics Help-Line.

**AWARDS CONFIRM WE'RE ON THE RIGHT TRACK**

TransCanada was the proud recipient of three prestigious corporate responsibility awards in 2004.

In February, the company won the **Ethics in Business Award**, part of the Alberta Business Awards of Distinction managed by the Alberta Chambers of Commerce.

TransCanada was recognized by *Canadian Business* magazine in August for having one of the top 10 boards of directors in Canada.

In November, the company was named to the **Dow Jones Sustainability World Index** for the third year running. TransCanada is the only pipeline company on the index, which tracks the performance of sustainability-driven companies. Eligibility for the index is based on a rigorous assessment of more than 50 broad performance criteria.



## our employees



TransCanada is committed to building human and organizational capabilities that give the company a competitive edge.

### Employee engagement

Employee engagement is the relationship between TransCanada and its employees. It encompasses personal morale, workplace climate and personal satisfaction. Annual employee engagement surveys measure employees' understanding of company strategy and their feelings about the work environment. We started surveying in the year 2000 and engagement has consistently improved over the last five years. The actual score has been going up rapidly every year, and we are now approaching the top quartile of larger Canadian companies.

### EMPLOYEE DEVELOPMENT

Employee Development refers to the acquisition of knowledge, skills or attitudes that enhance an employee's ability to perform in the workplace.

TransCanada chooses to invest in employees to ensure that they have the right skills and knowledge to successfully pursue their work. Employees work with their leaders to determine development plans, including an evaluation of skills and needs. Employee Development can take the form of both on-the-job and formal education, and TransCanada has programs in place to support both. We provide on-the-job development opportunities through new jobs and assignments, and support a wide variety of employee training programs. In addition, our Education and Training Assistance Program encourages professional development by refunding the cost of tuition for approved post-secondary studies.

TransCanada's Talent Management program involves the ongoing assessment, identification and development of leaders

to promote career growth and build leadership capability. The program's goal is to place the right people in the right roles at the right time.

Individuals participating in the program are identified through an annual process in which leaders assess key employee talent. While technical expertise is important, emphasis is also placed upon personal attributes such as exhibiting sound judgment, leading by example, inspiring trust, setting visions and being a good team player. Once identified, individuals are nurtured through various actions, including new assignments, roles and training.

Our Leadership Development program is offered to all leaders at TransCanada and includes a suite of programs for different levels. It is integrated with Talent Management.

Throughout 2005, TransCanada will track the effectiveness of the programs. Leaders will undergo a 360-degree effectiveness feedback from peers, staff and leaders. Such an evaluation will establish baselines





for the programs and aid in their evolution. For instance, as certain needs for leaders are met, new needs will be identified.

While such programs help individual employees enhance their skills and stay current and innovative in a changing workplace, they also boost confidence, motivation, morale and engagement. They contribute to our business success.

#### **BENEFITTING EMPLOYEES AND THEIR FAMILIES**

TransCanada provides a number of services to employees to benefit their health and well-being. These include:

- An Employee Family Assistance Program, which provides a range of counselling services to employees and their families,
- Disability Management Services, which work to identify and address health-related issues impacting employees, and
- Proactive health awareness and education sessions that enable employees to make improved lifestyle decisions.

TransCanada also encourages the dependent children of employees and retirees to further

their education through Post-Secondary Assistance Awards. This program provides financial assistance towards tuition.

#### **EMPLOYMENT EQUITY**

TransCanada is proud to note that in 2004, the Canadian Human Rights Commission (CHRC) found the company in full compliance in employment equity.

The process of moving toward employment equity began in 2001, when TransCanada participated in a government audit to assess our practices and determine where the company was under-represented in designated groups: women, members of visible minorities, people with disabilities and Aboriginals. The audit defined a number of areas for improvement, including women in management and persons with disabilities.

Since then, TransCanada has initiated a "respectful workplace" program, including policies, practices and action plans to address potential issues that affect designated groups and all employees, such as ensuring that internal hiring and promotion systems are barrier-free, and increasing awareness and understanding of employment equity.

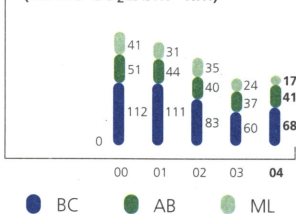


## 2004 statistics

TransCanada sets industry-leading targets for safety performance that provide a focus to monitor and improve our programs, modify our behaviours and continually improve our performance.

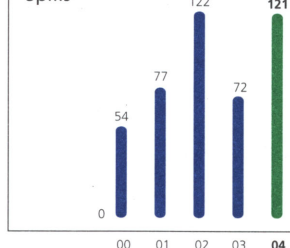
### ENVIRONMENT

Greenhouse Gas Emissions from BC, Alberta & Mainline Pipeline Systems (Intensity Basis) (tonne CO<sub>2</sub>E/bm<sup>3</sup>-km)



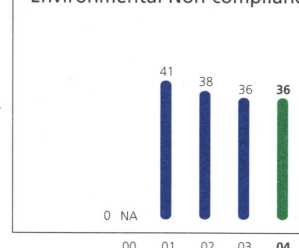
The gases that occur naturally or result from human activities such as the burning of fossil fuels. Greenhouse gases that are included in the TransCanada transmission targets are carbon dioxide, methane and nitrous oxide. Methane and nitrous oxide are normalized to carbon dioxide equivalents.

Spills\*



Total number of releases of a product or waste on-site or off-site that may or may not pose an adverse impact to the environment.

Environmental Non-compliance\*

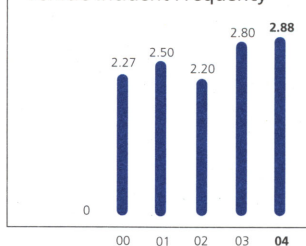


An event that may require reporting to an environmental agency and/or regulatory body.

\* Numbers are based on TransCanada's own internal Incident Management Classification Guide as part of the Incident Management System. The Guide has four categories – minor, serious, major and critical. TransCanada records all incidents (including those which are not reportable to a regulatory body) as part of its continuous improvement philosophy. The vast majority of incidents fall into the minor category (i.e. they have no adverse impact on the environment). No fines have been issued to TransCanada for environmental non-compliance by any external agencies.

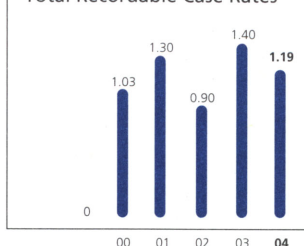
### EMPLOYEE HEALTH AND SAFETY

Vehicle Incident Frequency



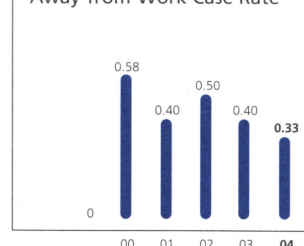
The number of recordable vehicle incidents related to a common exposure base of 1,000,000 kilometres driven. A recordable vehicle incident is any incident (regardless of fault) involving a fleet or rental motor vehicle that results in an injury to any person or damage to any vehicle or property, unless the vehicle was safely and legally parked at the time of the incident. On average, TransCanada experienced one incident for every 346,000 kilometres travelled.

Total Recordable Case Rates



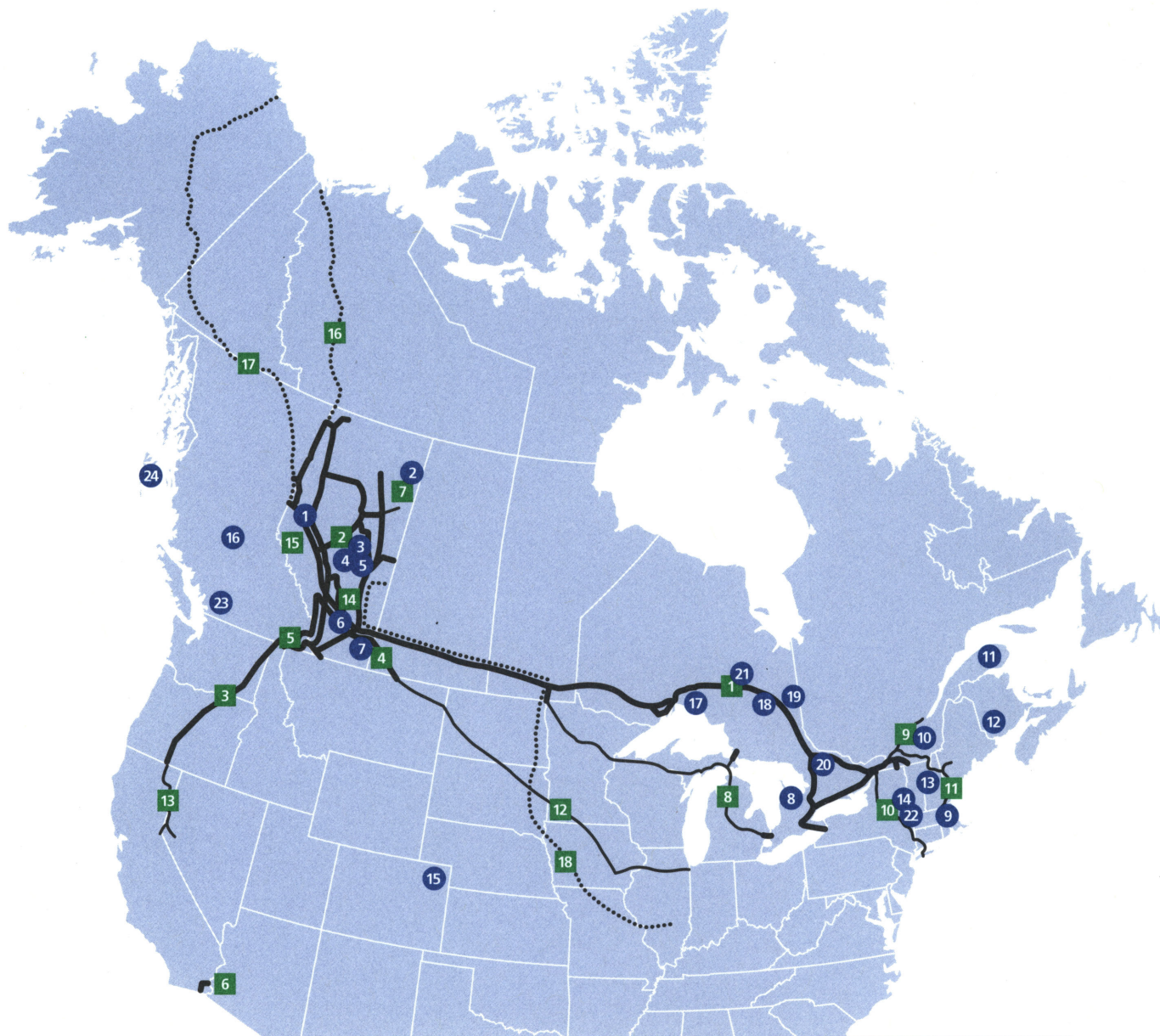
The number of recordable cases related to a common exposure base of 100 full-time employees. Recordable cases are all illnesses and work-related injuries which result in: loss of consciousness, restriction of work or motion, transfer to another job, loss of life or those that require medical treatment beyond first aid. On average, TransCanada experienced one workplace injury for every 84 person years of work.

Away-from-Work Case Rate



The number of away-from-work cases where the employee would have worked but could not because of occupational injury or illness, related to a common exposure base of 100 full-time employees. On average, TransCanada experienced 300 person years of work for every lost-time incident.





## NATURAL GAS TRANSMISSION

- 1 Canadian Mainline
- 2 Alberta System
- 3 Gas Transmission Northwest System
- 4 Foothills System
- 5 BC System
- 6 North Baja System
- 7 Ventures LP
- 8 Great Lakes
- 9 TQM
- 10 Iroquois
- 11 Portland
- 12 Northern Border
- 13 Tuscarora

- 14 CrossAlta (storage)
- 15 Edson (under development)
- 16 Mackenzie Gas Pipeline Project (proposed by producers)
- 17 Alaska Highway Pipeline Project (proposed by TransCanada)
- 18 Keystone Oil Pipeline Project (proposed by TransCanada)

— wholly owned  
 — partially owned  
 .... proposed

## POWER GENERATION

- 1 Bear Creek
- 2 MacKay River
- 3 Redwater
- 4 Sundance A PPA
- 5 Sundance B PPA (50 per cent)
- 6 Carseland
- 7 Cancarb
- 8 Bruce Power (31.6 per cent)
- 9 OSP
- 10 Bécancour (under construction)
- 11 Cartier Wind (proposed)
- 12 Grandview
- 13 Deerfield and Connecticut River Hydro Systems

TransCanada Power, L.P.  
 (30.6 per cent)

- 14 Curtis Palmer
- 15 ManChief
- 16 Williams Lake
- 17 Nipigon
- 18 Kapuskasing
- 19 Tunis
- 20 North Bay
- 21 Calstock
- 22 Castleton
- 23 Mamquam
- 24 Queen Charlotte



**TransCanada Corporation** 450 – 1st Street S.W., Calgary Alberta, Canada T2P 5H1  
tel: 403.920.2000 [www.transcanada.com](http://www.transcanada.com) toll-free: 1.800.661.3805



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# 2004 CLIMATE CHANGE AND AIR ISSUES ANNUAL REPORT



pipe

power



**TransCanada**  
*In business to deliver*



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#### IMAGES

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TransCanada PipeLines.

Large cover photo:

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**TransCanada is a leading North American energy infrastructure company focused on two complementary and interrelated businesses – natural gas transmission and power generation.**

TransCanada owns and operates more than 41,000 kilometres of pipeline, making it one of the largest natural gas transmission systems in North America. Our natural gas pipeline system is a vital transportation network. We link remote natural gas producing areas of the Western Canada Sedimentary Basin with markets throughout Canada and the United States.

Our pipeline network gathers natural gas from more than 1,200 locations, largely in Alberta, and transports it over long distances to some 300 delivery points across Canada. At these points, TransCanada connects with other pipeline carriers and distribution pipeline companies that deliver natural gas to consumers, businesses and industries throughout North America. In 2004, we delivered enough natural gas to heat roughly 28 million homes. A popular fuel due to its lower emissions impact, natural gas is used to heat homes, fuel businesses and drive major economic sectors.

TransCanada entered the North American power market in the early 1990s, recognizing the link between our natural gas transmission business and rising demand for electricity generation. Today, TransCanada owns and operates facilities that generate more than 2,000 megawatts of power. This includes TransCanada's wholly owned operating facilities as well as those under construction or in development. Natural gas and waste heat are used extensively to generate electricity at our wholly owned power facilities. We also have interests in non-operated facilities and projects currently in development that will generate some 4,500 megawatts of additional electricity using wind, nuclear, hydro and coal.

A detailed list and map of TransCanada's pipeline and power facilities is located on page 32 of this report.



## FROM THE PRESIDENT



*Hal Kvisle  
President and CEO  
TransCanada*

**T**ransCanada is in the business of transporting natural gas and generating electricity to meet the growing energy needs of businesses and consumers throughout North America. While expanding our business, TransCanada continuously identifies and takes early action to manage issues that could affect our ability to provide consumers with safe, reliable and cost-effective energy supplies. Among these issues are business risks associated with greenhouse gas emissions and air pollutants such as nitrogen oxides.

Greenhouse gases and nitrogen oxides are emitted from the combustion of fossil fuels, including natural gas. This low-emissions fuel is used extensively at TransCanada's facilities to operate the hundreds of turbine engines required to generate electricity and drive compressors that push natural gas through our pipeline network. The relationship is simple: generating more megawatts of electricity and transporting higher volumes of natural gas directly increases the amount of emissions produced by our facilities.

In the mid-1990s, TransCanada recognized the challenge of meeting the economy's rising demand for energy while responding to government and public pressure to limit greenhouse gases linked to climate change and nitrogen oxides that contribute to regional air quality issues such as



smog. To meet this challenge, TransCanada invested financial and human resources into researching, developing and applying new processes and technologies that have significantly increased the energy efficiency of our operations. At the same time, we have implemented industry-leading programs to reduce releases of methane – the chief component of natural gas – from one of the longest and most complex pipeline systems operating in the world today.

More than 10 years of emissions measurement and mitigation experience have provided TransCanada with a strategic business advantage, given growing government requirements for managing and reducing all air emissions. We continue to develop technologies that replace outdated measuring methods and statistically derived emissions estimates in order to create a more accurate and meaningful emissions inventory. At the same time, we have integrated our principles of emissions reduction throughout the TransCanada organization to ensure the potential business risks and opportunities posed by increasing environmental priorities are considered when making decisions regarding our pipeline and power businesses.

North America relies heavily on fossil fuels to supply the energy requirements of its ever-increasing population and growing industries. Higher investment in renewable and alternate energy technologies, such as TransCanada's Cartier Wind power project in Québec, will allow these energy sources to increase their market share. However, for the foreseeable future, North America will continue to need a safe and secure supply of fossil fuels. The policy, strategy and actions detailed in this report demonstrate that TransCanada is well-positioned to meet North America's energy needs in an environmentally responsible and economically effective manner.



*Hal Kvisle*  
*President and CEO*



## 2004 OVERVIEW

*TransCanada is investigating ways of capturing carbon dioxide produced by our pipeline operations and using it to improve other industrial processes.* Carbon dioxide – the largest component in TransCanada's greenhouse gas (GHG) emissions inventory – is the focus of a project that is evaluating the benefits of capturing, injecting and sequestering carbon dioxide in a subsurface reservoir to increase the recovery of coalbed methane. (See page 15.)

*Our fast-growing power business uses leading-edge processes and low-emissions fuels to generate electricity.* Six of TransCanada's seven wholly owned, producing power generation facilities have been built within the past five years and all seven operations are fuelled by natural gas or waste heat. Natural gas produces fewer GHG emissions than power plants driven by other fossil fuels such as coal or oil, and waste heat has a negligible GHG impact. Electricity generated from waste heat also fills demand for power that would typically be met by power generated from fossil fuels. Five of our power facilities use cogeneration technology, where waste heat and electricity are both produced from one fuel source – natural gas – providing improved energy efficiencies. TransCanada will continue to expand our power business wherever sound opportunities arise, which may include the construction of new, energy-efficient facilities or the acquisition of existing conventional power generating facilities. (See page 25.)

*TransCanada has developed industry-leading field procedures to reduce methane emissions from our pipelines.* We minimize the need for blowdowns, when methane is vented from a pipeline to enable safe construction or repairs, by planning and combining repair projects wherever practical. We also employ a range of advanced repair procedures to eliminate the need for blowdowns. Where blowdowns are unavoidable, TransCanada employs tractor-trailer-mounted transfer compressor units to capture methane that would otherwise be vented to the atmosphere. In addition, the most advanced equipment is used to measure methane releases. (See page 20.)

*TransCanada has steadily improved the accuracy of our GHG emissions inventory over the past decade through the development of new measuring tools.* Our ability to measure methane emissions from small leaks on the TransCanada pipeline system was vastly improved in 2004 with the acquisition of 10 high-flow samplers – enough to equip our entire pipeline maintenance group. The new samplers include microprocessors, which store data that is fed into TransCanada's GeoFind system, a map-driven, online database. The samplers accurately measure our actual fugitive emissions and are a substantial improvement over the previous method of "bagging" leaks in plastic to determine flow rates, which were then used to develop emissions estimates. The commercial availability of the high-flow sampler is a milestone in the development of this technology, which TransCanada has supported through our participation in field tests of the first prototype. (See page 22.)



*TransCanada has invested financial and human resources in new processes and technologies that have significantly reduced the volume of GHG emissions produced to deliver a unit of natural gas to market.*



*TransCanada is working on new technologies – from fuel cells to capturing carbon dioxide emissions – to reduce the amount of emissions produced by our operations.*

*TransCanada is involved in research and development work aimed at preventing or mitigating methane emissions, which have a high GHG impact.* We're working to improve the efficiency of a prototype portable incinerator used to burn residual methane left in pipelines after transfer compression. Another project involves developing a process to convert methane emissions to carbon dioxide using biofiltration, reducing the GHG impact of methane by more than 80 per cent. Biofilters could be installed at sites throughout our pipeline system where certain equipment emits small volumes of pressurized methane as part of normal operating practices. We are also working on a method of combining emissions of methane – the chief component of natural gas – with fuel gas and using it to drive pipeline compressors. (See page 15.)

*TransCanada is working to develop the next generation of energy-efficient technology – fuel cells.* We are piloting a proton exchange membrane (PEM) project in Alberta that will evaluate the fuel cell's technical, economic and environmental performance. If successful, the fuel cell could provide a more efficient and low-emissions alternative to thermal electric generators (TEGs) that now provide electrical power to TransCanada's remote pipeline facilities. TEGs operate at about two to three per cent thermal efficiency, while fuel cells offer efficiencies in the 30 to 40 per cent range and are expected to climb. (See page 14.)



## CHANGES TO THIS REPORT

This is TransCanada's second Climate Change and Air Issues Annual Report and our eleventh public report on greenhouse gas (GHG) management programs. Our report has changed as public policy on climate change and air issues has evolved and this year marks another step in that process.

TransCanada began detailed public reporting of GHG emissions in 1995 as a committed supporter of Canada's Climate Change Voluntary Challenge & Registry Inc. (VCR). Under this program, the Canadian federal government challenged industry to voluntarily reduce GHG emissions and publish annual reports detailing their progress in managing emissions. The voluntary program was launched to help Canada manage the growth in its GHG emissions. TransCanada welcomed this voluntary approach and, for a decade, submitted increasingly detailed documents that regularly won gold-level reporting awards based on the VCR reporting regime.

Our VCR report, with a dozen tables and charts of emissions history, became a key tool for our emissions management strategy and we made plans to extend its scope to cover other emissions besides GHGs. With the conclusion of the government's voluntary climate change program in 2004, TransCanada published our first Climate Change and Air Issues Annual Report, which expanded our GHG management and public reporting process to cover management plans for nitrogen oxides, or NOx. We also increased the scope of our report to cover all wholly owned facilities in the United States, as well as Canada.

But our report has also changed in other ways.

In 2005, the Canadian government moved from a voluntary reporting process to mandatory reporting of GHG emissions to Statistics Canada. The change is part of the government's plan to meet its commitment under the Kyoto Protocol, an international climate change agreement to reduce global GHG emissions. As part of this effort, the government is consulting broadly with industry to establish a new single system for GHG reporting. This new standard will replace existing and somewhat different methods used by the VCR and Statistics Canada.

During this transition period, TransCanada has decided not to publish the emissions data that has appeared in all our previous reports since the data has been developed according to VCR requirements. This will avoid the confusion inherent in publishing figures while a new system is in the process of being developed.

As required, our GHG emissions data has been submitted to Statistics Canada, while NOx numbers have been filed with the National Pollutant Release Inventory (NPRI) since 2003. While standards are being finalized for GHG emissions reporting, this report will focus on describing management plans and emissions mitigation programs that demonstrate TransCanada's ability to limit emissions from our facilities.

We list, but do not report on, several major pipeline and power facilities in which TransCanada holds significant interests but whose management and day-to-day operational control are provided by third parties. (See pages 31-35.) In 2005, TransCanada sold its interest in TransCanada Power, L.P., so facilities owned by Power LP are not included in this report.



*TransCanada has annually published details of our GHG emissions actions and plans for more than 10 years.*



Greenhouse gas emissions (GHGs) are linked to global climate change while nitrogen oxides (NOx) contribute to regional air quality issues that affect the environment and human health. While the nature and impacts of these emissions differ, both types of emissions can result from the same source – the combustion of fossil fuels.



## OUR EMISSIONS SOURCES

### GHG Emissions

Greenhouse gas emissions are different than air pollutants and have been linked with global climate change. The operation of pipeline and power facilities produces “direct” emissions of three GHGs: carbon dioxide, methane and nitrous oxide. TransCanada also accounts for indirect emissions, which are produced by companies that generate the electricity TransCanada purchases for use at our facilities. GHG impacts are global, which means reductions in any part of the world will help limit the effects of these emissions on the climate.

### Carbon Dioxide

The largest component of TransCanada’s direct GHG emissions inventory is carbon dioxide, at 89 per cent. Most of our carbon dioxide emissions result from the combustion of natural gas at our pipeline facilities. Much smaller amounts are produced from our power generation plants.

### Methane

Methane makes up nine per cent of TransCanada’s direct GHG emissions inventory. Methane is the chief component of natural gas. It is largely emitted from small leaks throughout our pipeline system, from components that are engineered to release methane during normal operations and during blowdowns, when natural gas is vented to the atmosphere to allow for construction and maintenance work. Negligible amounts are released from our power operations.



## STRATEGY

### Nitrous Oxide

Very small amounts of nitrous oxide – two per cent of total direct GHGs – are emitted as a byproduct of the combustion of natural gas at our pipeline and power facilities.

### Indirect Sources

About eight per cent of our total GHG emissions inventory is classified as indirect. Since indirect emissions are associated with the electricity TransCanada purchases from third parties for use at our pipeline facilities, the amount of these emissions depends on whether the electricity is produced using coal or natural gas. Natural gas-fired power plants produce less carbon dioxide than coal-fired plants on a per-unit-energy-input basis.

### GHG Basics

The three GHGs commonly produced by TransCanada are carbon dioxide, methane and nitrous oxide. Carbon dioxide is the highest volume GHG emission produced by human activities. For this reason the global warming impacts of other GHGs are commonly expressed as carbon dioxide equivalent. This is done by multiplying tonnes of emissions by their global warming potential, a factor determined by the world scientific community. This factor recognizes some GHG emissions are more potent than others in trapping heat within the atmosphere. For example, one tonne of methane has the same global warming potential over 100 years as 21 tonnes of carbon dioxide, while nitrous oxide has a global warming potential of 310.

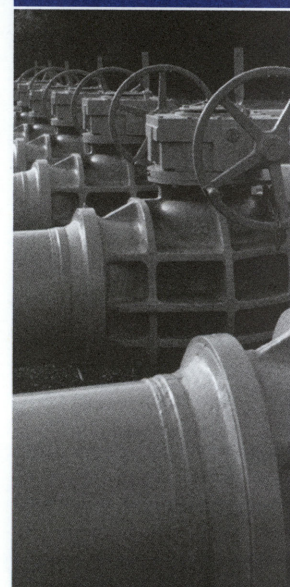
### Global Warming Potentials

CO <sub>2</sub>	carbon dioxide	one tonne x 1	=	tonnes carbon dioxide equivalent (CO <sub>2</sub> E)
CH <sub>4</sub>	methane	one tonne x 21	=	tonnes carbon dioxide equivalent (CO <sub>2</sub> E)
N <sub>2</sub> O	nitrous oxide	one tonne x 310	=	tonnes carbon dioxide equivalent (CO <sub>2</sub> E)

### Nitrogen Oxides

Nitrogen oxides (NOx) are air pollutants that contribute to the formation of smog. NOx results from the combustion of fossil fuels such as the natural gas used extensively by TransCanada facilities. NOx is formed due to the high temperatures used during combustion, which oxidize the large quantities of air consumed during the process. Since NOx contributes to regional air issues, reductions must occur regionally to be effective.

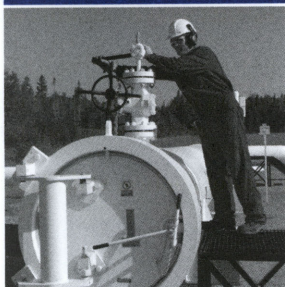
*Almost 90 per cent of our GHG inventory consists of carbon dioxide emissions produced by the more than 300 natural gas-fired compressor engines required to move natural gas through our pipeline system.*





*Our extensive work on climate change has provided TransCanada with the experience and expertise to manage GHG emissions.*

*The Kyoto Protocol is designed to reduce man-made GHG emissions linked to global climate change.*



## NOx Basics

Nitrogen oxides (NOx) are formed during the high-temperature combustion of fossil fuels, including natural gas, coal, oil and oil products such as gasoline. NOx is a generic term that describes a group of gases composed of nitrogen and oxygen in varying amounts, including nitrogen dioxide (NO<sub>2</sub>), nitric oxide (NO) and nitrous oxide (N<sub>2</sub>O). NOx and volatile organic compounds (VOCs), which are carbon-containing gases and vapours, react in sunlight and stagnant air to form ground-level ozone. This colourless but physically irritating gas combines with airborne particles to create smog. NOx and sulphur dioxide react with other substances in the air to form acids, which fall to the earth as rain, snow, fog or dust particles. Acid rain causes extensive damage to cars, buildings and vital natural resources and ecosystems that can't neutralize the acid.

### Nitrous Oxide

A very small percentage of NOx is formed as N<sub>2</sub>O, a GHG that traps heat at the earth's surface and contributes to global climate change. Nitrous oxide is, therefore, reported within the GHG sections of this report.

## OUR CLIMATE CHANGE AND AIR ISSUES POLICY AND PRINCIPLES

### Policy

TransCanada is committed to developing innovative and economically effective solutions to manage climate change and air quality issues. These solutions will evolve from excellence in environmental performance and technology development.

### Principles

#### 1. TransCanada supports a unified North American response to climate change and air quality issues where it is appropriate.

- Co-operation on a North American basis is clearly needed, given the geographical proximity and strong environmental and economic ties that exist between Canada and the United States.
- North American competitiveness must be maintained or enhanced while working toward solutions to manage greenhouse gas and air emissions.



## STRATEGY

### **2. TransCanada believes emissions reduction targets and timeframes must balance environmental and socioeconomic considerations.**

- TransCanada will meet or exceed legislative requirements for emissions.
- Governments and stakeholders should continue their dialogue to establish the appropriate level and timing of emissions targets.
- Targets and schedules must be based on the availability of commercially viable technology.

### **3. TransCanada believes prudent action is required on climate change and air quality issues.**

- TransCanada will manage GHG emissions from our operations on an intensity basis. (GHG intensity is defined as tonnes of emissions per unit of production.)
- GHG and air policy considerations will be incorporated into the company's business evaluations.

### **4. TransCanada believes the low-emissions natural gas we transport and energy-efficient electricity we generate are part of the solution to global climate change and regional air quality issues.**

- TransCanada will facilitate the use of natural gas as a fuel source because it is less carbon intensive than other fossil fuels.

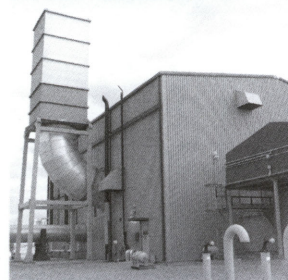
### **5. TransCanada is committed to technological solutions to climate change and air quality issues.**

- TransCanada will continue to support research and technology initiatives that mitigate the GHG and air impacts of our business.
- TransCanada will support collaborative research initiatives that promote efficient energy use and lower emissions.
- TransCanada will work to implement technologies that reduce GHG and air emissions.

### **6. TransCanada believes every individual, industry and government must be involved in managing/reducing emissions that contribute to climate change and air quality issues.**

- TransCanada will engage our employees, customers, vendors and shareholders in climate change and air quality issues.
- TransCanada will continue to exchange information with governments, industries and consumers about our actions to manage emissions related to climate change and air quality concerns.

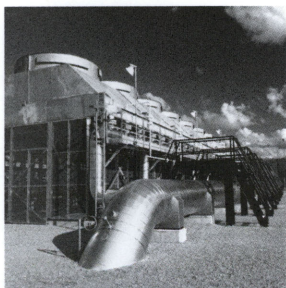
*Innovation and technology development are key to further improvements in the energy efficiency of our operations.*



## OUR STRATEGY

Our strategy is designed to limit the growth of the greenhouse gas emissions intensity of our North American pipeline and power facilities while meeting our business objectives. Since natural gas is less carbon intensive and produces fewer GHG emissions per unit of output than other fossil fuels, we will increase our ability to deliver this clean-burning fuel to North American markets. At the same time, we will increase our power generating capacity, using some of the most innovative and energy-efficient methods available today.





*TransCanada's strategy is designed to limit the growth of our greenhouse gas emissions intensity while expanding our pipeline and power businesses.*

Our strategy includes:

**1. Conserving energy through improvements to overall facility efficiency.**

TransCanada continues to reduce energy use where possible by improving the energy efficiency of our pipeline and power facilities. This includes the use of low- or zero-emissions fuels such as natural gas and waste heat. We also employ highly efficient processes such as the cogeneration technology used extensively in our power business. In our cogeneration power facilities, we use one fuel source – natural gas – to generate electricity and produce steam for industrial heat and energy. These cogeneration facilities have high energy efficiencies.

**2. Conducting research and development work designed to reduce GHG and air emissions.**

Technological innovation is critical to managing the complex and interrelated issues surrounding GHG and air emissions. With demand for low-emissions natural gas and electricity steadily climbing, the industry needs new technologies that improve combustion and process efficiencies and limit the formation of emissions.

**3. Gaining experience with flexible market mechanisms and their role in achieving cost-effective and verifiable GHG reductions.**

TransCanada has developed experience with trading GHG emissions credits through our participation in various projects. The flexibility provided by these mechanisms is critical to TransCanada because our ability to reduce GHG emissions is constrained by the limitations of existing energy-efficient combustion technologies, the nature of our pipeline system, and rising demand for natural gas and electricity.

**4. Participating in public policy forums related to emissions issues.**

TransCanada shares information about the emissions challenges and opportunities facing the natural gas transmission and power generation sectors through our involvement in policy forums established by government, industry and other stakeholder groups. This helps participants to identify and develop pragmatic solutions that meet the needs of all stakeholders.

**5. Taking part in public awareness initiatives and education programs focused on climate change and air quality issues.**

We believe it is important to engage the public in these issues because they have wide-ranging implications for every individual, business sector and nation. TransCanada takes advantage of opportunities to educate our employees and the general public about emissions and how individual actions can contribute to solutions.

## **Energy Conservation**

For more than a decade, TransCanada has managed energy efficiency on a company-wide basis in order to meet environmental and business objectives.

We've taken economic opportunities to reduce pipeline energy consumption by installing new, high-efficiency compressor engines when replacing equipment. We've also systematically eliminated pipeline leaks to conserve



## STRATEGY

methane and reduced fuel consumption and associated emissions from our vehicle fleet by about 10 per cent since 1990.

All our wholly owned power plants are built to conserve energy, using cogeneration, combined cycle cogeneration or waste heat recovery to maximize electrical output and minimize fuel consumption. Cogeneration power plants increase efficiency by providing waste heat to nearby industries, while combined cycle cogeneration plants use some of the waste heat to increase electric power output. Our Cancarb electric power facility in southern Alberta is fuelled almost exclusively by zero-emissions waste heat received from an adjacent industrial process that drives steam-powered generators.

In late 2004, TransCanada's pursuit of energy-efficient power production continued with the startup of the 90-megawatt (MW) Grandview cogeneration plant in Saint John, New Brunswick. This pattern was repeated throughout 2005, with the construction of the 550-MW Bécancour cogeneration plant near Trois-Rivières, Québec, and the acquisition of 567 MW of hydroelectric power production in the U.S. Northeast with the purchase of USGen New England assets. This purchase is now known as TransCanada's U.S. Northeast Hydro Systems.

In addition, TransCanada is the lead investor in the Cartier Wind power project, which will provide some 740 MW of wind-powered electric generating capacity to the Québec power grid over the next six years.

In the future, TransCanada will continue to expand its power business wherever opportunities arise. This will include the construction of new, energy-efficient facilities and the acquisition of existing conventional power generating facilities.

### Public Engagement

TransCanada supports programs that engage the public in reducing energy consumption and related emissions. Industries, governments and the public must work co-operatively to improve their energy efficiency and develop solutions that balance Canada's economic and environmental objectives.

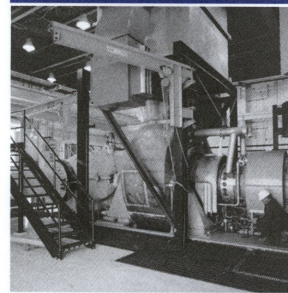
### Promoting Sustainability

In Québec, TransCanada is supporting the Montréal Nature Museums Foundation in a contest that promotes environmental protection and conservation among primary grade students. Teachers in Montréal are invited to submit a report about a class project that created a positive change in their environment and raised their school community's awareness of sustainable environmental protection and conservation. The winning class is invited to a VIP visit of the four museums, with a sleepover in one of the Biodome's ecosystems.

### Environmental Restoration

Years of uncontrolled access have had a significant environmental impact on Calgary's Inglewood Bird Sanctuary. To help restore the area, in May 2004 TransCanada volunteers, City of Calgary staff and more than 100 grade nine students from Thomas B Riley Junior High School planted about 200 shrubs and 1,000 plugs of wildflowers. This is the second time TransCanada has been involved with the city's restoration activities in

*TransCanada has reduced the amount of energy required to deliver a unit of natural gas and established a power business that uses low-emissions fuels and processes.*







*TransCanada supports educational programs and activities that help students and employees understand how lifestyle choices affect their energy use.*

the Inglewood area. In 2003, TransCanada employees participated in a similar project, planting about 1,800 trees along the sanctuary's riverbank.

In 2004, TransCanada helped purchase plant materials and provided 13 employee volunteers to help students with planting activities.

### Destination Conservation

TransCanada continues to support a Destination Conservation ([www.dcplanet.org](http://www.dcplanet.org)) program that has helped more than 37 schools in the Calgary area cut \$143,700 in electricity costs over the past five years. This student-driven program has involved teachers, principals and custodians in activities that reduce daily energy use and waste at their schools, while saving money as well as reducing GHGs and air emissions. The Calgary Board of Education returned 20 per cent of the financial savings to the participating schools in the form of rebates. Destination Conservation is a partnership of government, industry and special interest groups that raises environmental awareness among students.

TransCanada also sponsors Destination Conservation's Climate Change Challenge for students in grades four to 12. About 390 introductory-level climate change questions are featured on this web-based, animated program ([www.co2challenge.com](http://www.co2challenge.com)), along with games, environmental news and teacher lesson plans. The program includes a national student competition to test climate change knowledge, and delivery of presentations at dozens of teaching-related events across Canada. TransCanada's sponsorship of this program continued into the 2004/2005 school year.

### Green Learning

TransCanada supports Greenlearning.ca, an innovative, web-based project that provides Alberta schools with timely and accurate environmental information and support on topics such as climate protection and energy efficiency. Green Learning Online, a project of the Pembina Institute, offers a ready-made, approved curriculum guide for teachers, as well as web-based activities for most lesson plans. The information is also available to all Albertans through the website's public areas. TransCanada, along with governments and other industry partners, has provided financial support and expertise to help develop this resource for students and teachers. The Pembina Institute is an independent, not-for-profit environmental policy, research and education organization.

### Climate Conscious

TransCanada has included Environment Canada's Idle-Free campaign in our Climate Conscious program, which increases employee awareness of how individual lifestyle choices can reduce GHG emissions. The Idle-Free campaign encourages individuals to reduce auto emissions by avoiding needless idling of vehicle engines at home and at work, particularly during the winter. TransCanada's Climate Conscious program helps employees track their daily production of GHG emissions and suggests how they can reduce emissions by changing their energy habits.



## STRATEGY

### Commuter Challenge

Environment Week 2004 marked TransCanada's renewed commitment to the Calgary Commuter Challenge ([www.calgarycommute.ca](http://www.calgarycommute.ca)). More than 400 TransCanada employees – twice as many as the previous year – took part in this nationwide challenge, which encourages people to find energy-efficient methods of travelling to and from work.

By walking, in-line skating, cycling, car pooling and taking public transit to work, or by working from home, these employees eliminated the equivalent of 10,588 kilograms of carbon dioxide. They logged about 46,000 kilometres – twice as much as the previous year – which earned them first place in the “over 1,000 employees” category in Calgary for employee participation and distance travelled. Employees also attended workshops and displays about global climate change to learn more about how they can help reduce individual GHG emissions. In addition to being an active participant in the challenge, TransCanada also helps sponsor the event.

### New Technology

Innovation and technology development are key to further emissions reductions from TransCanada's facilities. As a leading pipeline innovator, our work is focused on using this expertise to develop new methods of reducing emissions from our pipeline operations.

### Fuel Cell Research

We are piloting a proton exchange membrane (PEM) project in Alberta that will evaluate this fuel cell's technical, economic and environmental performance. If successful, the PEM fuel cell could provide a more efficient and low-emissions alternative to thermal electric generators (TEGs) that now provide electrical power to TransCanada's remote pipeline facilities. TEGs operate at about two to three per cent thermal efficiency, while fuel cells offer efficiencies in the 30 to 40 per cent range and are expected to climb. Fuel cells are devices that convert the energy of a fuel (hydrogen, natural gas, methanol or gasoline) and air or oxygen into electricity. Although there are several types of fuel cells, PEM is emerging as an option in small-scale applications.

### Dry Gas Seal Mitigation

TransCanada is refining a process that captures fugitive methane emissions from dry gas seals on pipeline compressors. The captured methane is added to the fuel gas required to drive compressor engines. This process builds on early dry gas seal technology pioneered by TransCanada that improved the efficiency of the seal, reducing fugitive methane emissions as well as eliminating oil and grease spills. The new system is currently being tested to ensure safe, trouble-free operation.

### Carbon Dioxide Capture

TransCanada is investigating methods of capturing carbon dioxide (CO<sub>2</sub>) from our pipeline compressor engines – the major source of our GHG emissions – for use in selected industrial applications. Compressor



*TransCanada employees joined with Thomas B Riley Junior High School students and City of Calgary staff to plant shrubs and wildflowers at Calgary's Inglewood Bird Sanctuary.*

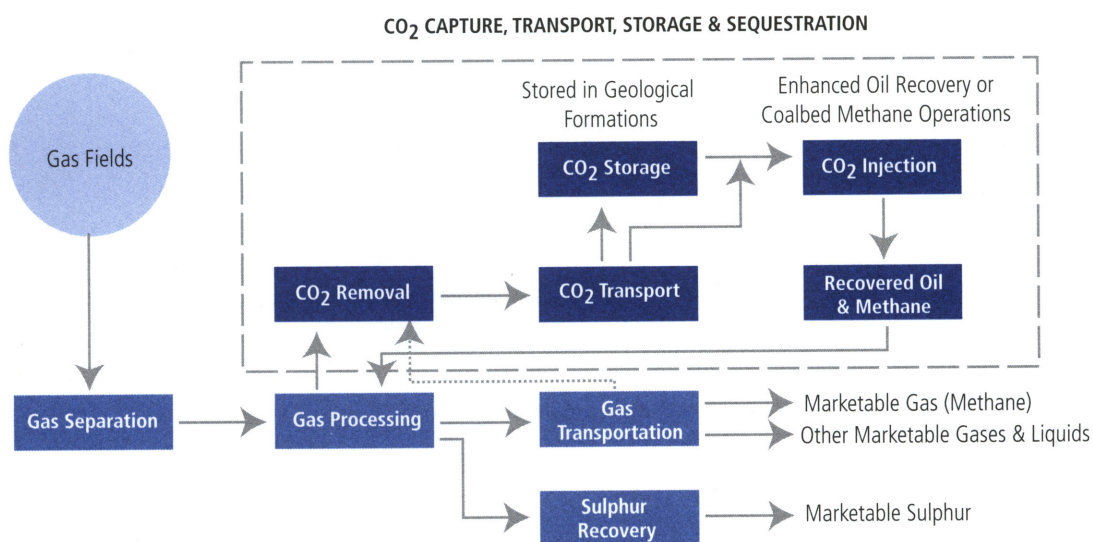


engine emissions typically contain only about two to five per cent carbon dioxide, which is not sufficiently pure for industrial applications. It must be processed into a higher concentration to meet specifications for industrial use.

### Closed-Cycle Carbon Dioxide Capture Pilot

TransCanada is one of several consortium members involved in a project that is evaluating the benefits of capturing carbon dioxide and injecting it into subsurface coalbed methane reservoirs to increase methane recovery. In this closed-cycle pilot project, CO<sub>2</sub> emissions will be captured, injected and then stored or sequestered in the subsurface reservoir. This work is being undertaken in conjunction with Sustainable Development Technology Canada™, a not-for-profit foundation that supports the development of technologies that address environmental issues.

DIAGRAM 1 – CARBON DIOXIDE CAPTURE



### Methane Biofiltration

Converting methane to carbon dioxide substantially reduces its GHG impact on the environment. TransCanada is testing biofilters that do just that. Reducing methane is important because it's 21 times more potent than carbon dioxide in trapping heat to the earth's surface. Through TransCanada's work with the University of Calgary, a biofilter has been developed that oxidizes more than 90 per cent of a methane emissions stream into carbon dioxide. The biofilter is specifically designed for use on pipeline components that are engineered to release methane as part of their normal operations. Since biofilters could be used at more than 300 TransCanada meter stations that produce engineered emissions, this technology has important potential to mitigate methane emissions. TransCanada currently has three pilot biofilters in operation and is continuing to work with the University of Calgary to enhance their design, operation and maintenance.

TransCanada is developing a process to capture methane emissions from dry gas seals for reinjection into fuel gas lines feeding compressor engines.

TransCanada is assessing GHG emissions trading, a market-based reduction method established under the Kyoto Protocol.



## STRATEGY

### Incineration

TransCanada is conducting a pilot project to test the efficiency of portable methane incinerators in reducing the GHG impact of blowdowns. A blowdown occurs when methane is vented to the atmosphere from a section of pipeline to allow for construction or maintenance work. TransCanada avoids blowdowns where possible but where there is no other option, the incinerator burns the residual methane left in the pipeline following the blowdown. Incineration converts the methane to carbon dioxide, reducing its GHG impact by 80 per cent. Preliminary testing has shown potential benefits of incineration, but more work was done in 2005 to reduce incineration times and increase efficiencies.

### Flexible Mechanisms

The international community has established flexible mechanisms under the Kyoto Protocol to help countries and companies develop cost-effective and verifiable GHG emissions reductions. As a major North American pipeline and power company, TransCanada is gaining experience with flexible mechanisms and the role they will play in continental emissions policy.

### GEMCo

TransCanada is a founding member of the Greenhouse Emissions Management Consortium (GEMCo), a partnership of Canadian energy companies focused on market-based GHG reductions such as GHG emissions trading. GHG emissions trading allows companies facing prohibitively high emissions reduction costs to purchase credits or allowances from companies that can achieve lower-cost reductions. Achieving the most cost-effective GHG emissions reductions may limit negative impacts on consumers and the economy.

### Carbon Dioxide Reinjection

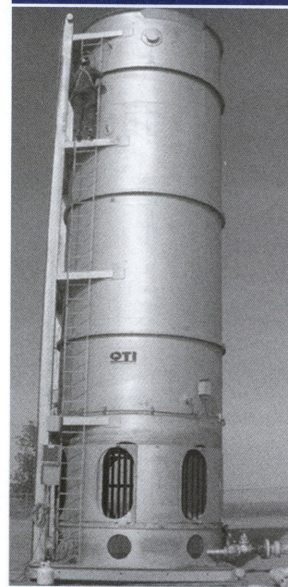
In one GEMCo initiative, carbon dioxide emissions are captured from a natural gas processing plant in Texas. The carbon dioxide is then injected into nearby oil reservoirs to enhance the recovery of crude oil.

Capturing carbon dioxide and then storing or sequestering it in an underground oil reservoir prevents the release of this GHG into the atmosphere. The resulting GHG emissions savings are translated into emissions credits, which are purchased by GEMCo. TransCanada has a share in the emissions credits provided by this project.

### Capturing Landfill Gas

In British Columbia, a GEMCo initiative recovers methane produced from decomposing material in a landfill and uses it as fuel gas. The methane is transported by pipeline to a paper recycling plant where it supplements the mill's existing natural gas supply. The project is expected to reduce GHG emissions by 15,000 tonnes per year of carbon dioxide equivalent over 10 years.

*TransCanada participates in a number of research projects designed to reduce emissions from our pipeline operations.*



*A pilot project is testing the efficiency of portable methane incinerators in reducing the GHG impact of blowdowns.*



The scientific community has linked global climate change to increased atmospheric concentrations of greenhouse gas (GHG) emissions caused by human activities. The operation of our pipeline network produces three types of GHG emissions, which we report annually to the Canadian government.

## MANAGING GHG EMISSIONS

### PIPELINES

#### TransCanada's Role in North American Pipelines

The United States and Canada rely on natural gas for 25 per cent of their combined energy consumption. Western Canadian natural gas meets nearly all of Canada's natural gas demand and provides the majority of natural gas imported by the United States.

In 2004, TransCanada's wholly owned Alberta System gathered roughly two-thirds of the natural gas produced in Western Canada or about 15 per cent of total Canada/U.S. natural gas production. The Alberta System transported this gas to our other wholly owned Canadian pipelines – the Canadian Mainline, the Foothills System and the BC System. These lines move western Canadian natural gas to transmission and distribution systems throughout Canada and the United States. Our BC System connects with our wholly owned Gas Transmission Northwest (GTN) System, which carries gas to California. GTN was acquired in the fall of 2004, along with the North Baja System, which carries gas from Arizona to California. These two recent acquisitions have not yet been integrated into our management systems and are therefore not included in this report. In total, TransCanada operates 41,000 kilometres of pipeline. There may be five to seven separate pipelines contained in a single right of way.

Our Canadian network gathers natural gas from about 1,200 receipt points in remote natural gas producing areas throughout Western Canada. It also has roughly 300 meter stations at major points across Western and Central Canada for delivering natural gas to our customers, who include other major pipeline transportation and distribution carriers that deliver gas to locations throughout Canada and the United States. In 2004, TransCanada's wholly owned pipeline network delivered 30 to 40 per cent of its total volumes to Canadian destinations and 60 to 70 per cent to U.S. markets.



## MANAGING GHG EMISSIONS

TransCanada's complex receipt and delivery role is dramatically different from most other pipelines, whose receipt and delivery points typically number in the dozens.

For example, TransCanada's Canadian Mainline System route covers 4,000 linear kilometres. It passes through four Canadian provinces, making deliveries to gas pipelines located in the provinces of Saskatchewan, Manitoba, Ontario and Québec and in the states of Vermont, Minnesota and New York. The Canadian Mainline was constructed in the late 1950s over the longer, all-Canadian route – rather than a shorter route south of the Great Lakes – at the request of the Canadian government.

All these elements – distance, volumes, receipt and delivery points – require much greater compression power than other pipelines. More than 300 compressor units are needed to gather and move gas along TransCanada's wholly owned system, while other lines require only a handful of compressors.

For these reasons, TransCanada is a major fuel consumer. Since 1990, our system has grown dramatically to keep pace with North American natural gas demand. Installed compression has increased by 72 per cent while the length of pipeline in service has increased by 36 per cent. During this period, volumes have increased by 98 per cent on the Canadian Mainline System, 38 per cent on the Alberta System, 40 per cent on the BC System and 168 per cent on the Foothills System. As part of our climate change commitment, we've dramatically reduced the amount of fuel – and associated emissions – it takes to move a unit of natural gas to market through our system. But the essential role played by TransCanada means that our fuel consumption and emissions profiles will be governed by factors different from those of other pipeline systems performing other types of service.

### Pipeline Quickfacts

**Length** – kilometres (km)    **Volumes** – billions of cubic metres per year (bm<sup>3</sup>/yr)

Facility	Length	Volumes
Alberta	23,186	111.7
British Columbia	201	10.3
Foothills	1,040	32.5
Canadian Mainline	14,898	74.9
Gas Transmission Northwest*	2,174	5.2
North Baja*	128	0.37
Total Length	41,627	N/A

*Pipeline routes are detailed in the foldout map within the Facilities section at the end of this report.*

\* Gas Transmission Northwest and the North Baja System were purchased in November 2004. Volumes listed here are prorated for the two months of TransCanada ownership in 2004.

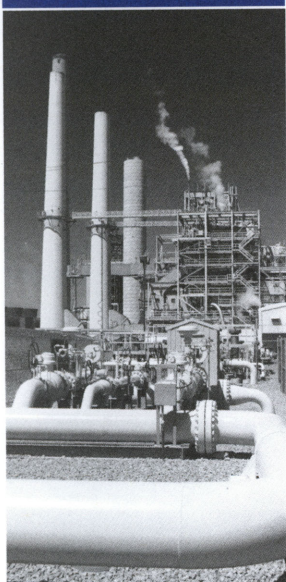
Installations	Count
Compressor Units	309
Compressor Rating (megawatts)	4,077



*In 2004, TransCanada transported about two-thirds of the natural gas produced in Western Canada – enough natural gas to heat about 28 million homes.*



*Our pipeline system has a complex pickup and delivery role, quite different from most other North American pipeline systems.*



## GHG Sources

The operation of our pipeline systems produces three types of GHG emissions: carbon dioxide, methane and nitrous oxide. Nitrous oxide is a very small portion of total carbon dioxide equivalent emissions and comes from essentially the same sources as carbon dioxide.

### Carbon Dioxide Sources

- Natural gas-fired turbines and reciprocating engines that drive compressors used to move natural gas through TransCanada's pipelines at speeds of 30 kilometres per hour.
- Natural gas or diesel fuel consumed by boilers required for space heating and auxiliary or backup generators in case of power interruptions at compressor stations.
- Line heaters that burn natural gas to raise the temperature of sales gas at storage and production facilities.

### Methane Sources

- Fugitive emissions from small leaks that occur throughout all pipeline systems.
- Fugitive emissions from components that are engineered to emit methane as part of normal operations.
- Fugitive emissions from pipeline blowdowns, when natural gas is vented to the atmosphere to allow for safe maintenance and construction activities.
- Unburned hydrocarbons (methane) in exhaust gases.

## Measuring GHG Emissions

Consumer demand for natural gas is entirely outside TransCanada's control; however, changes in demand have a dramatic impact on our total GHG emissions profile.

That's why we measure and report pipeline GHG emissions in two ways: total GHG emissions and GHG intensity. GHG intensity compares total pipeline emissions against gas volumes delivered and average distance of haul for each pipeline system. GHG intensity is the most accurate way of measuring TransCanada's ability to manage emissions while delivering major gas volumes over long distances.

TransCanada will continue to measure and report total tonnes of GHG emissions as required, but we will also calculate pipeline GHG intensity as an indicator of progress in our emissions management.



### Reducing Pipeline GHG Intensity

TransCanada has established the following performance indicators to track and measure success in three specific areas that affect the GHG emissions intensity of our pipeline network. These performance measures are:

- carbon dioxide emissions
- fugitive methane emissions from blowdowns, when gas is vented from lines to enable safe maintenance or repairs
- fugitive methane emissions from leaks and engineered sources.

### Reducing Carbon Dioxide Emissions

Two-thirds of TransCanada's total GHG emissions inventory consists of carbon dioxide (CO<sub>2</sub>) emissions from the compressor engines required to move natural gas through our pipelines. Installing high-efficiency turbine engines when replacing older units or adding capacity has helped reduce pipeline CO<sub>2</sub> emissions since 1990. But our ability to achieve further reductions in this area will depend on the development of new compressor technologies and significant improvements in CO<sub>2</sub> removal, transportation and storage or sequestration.

Today, roughly 85 per cent of TransCanada's compression power is derived from natural gas-fired turbine engines. Some of these are aeroderivative turbine engines, which are similar to airplane engines and can have energy efficiencies as high as 39 per cent. About seven per cent of our compression power is provided by less efficient natural gas-fired reciprocating engines and another seven per cent from electric drives. The average energy efficiency of TransCanada's pipeline compressor engines is 35 per cent. That means 35 per cent of the total fuel consumed actually produces the mechanical power that drives compressor engines. The rest of the consumed fuel is lost to mechanical friction, or waste heat, which is emitted from exhaust stacks. TransCanada has implemented maintenance procedures to ensure efficiencies are maintained at peak levels.

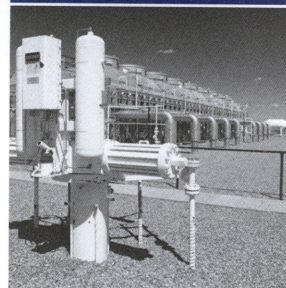
The new turbine engines are an improvement over older models that had thermal efficiencies as low as 25 per cent. However, replacement decisions have to meet strict cost/benefit criteria because a 30-megawatt (MW) turbine engine costs roughly \$30 million to purchase and install and has a lifespan of 25 to 30 years.

### Reducing Fugitive Methane Emissions from Blowdowns

Realistically, TransCanada's largest opportunity for reductions in GHG emissions lies with controlling fugitive and blowdown emissions of methane, the chief component of natural gas. In 2004, methane made up 8.3 per cent of TransCanada's total GHG emissions and 10 per cent of pipeline GHGs, with virtually all methane emissions attributed to our pipeline network.

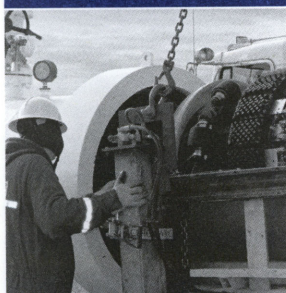
Having eliminated nearly three-quarters of total methane emissions since 1990, there are now fewer ways in which we can achieve further methane reductions. But we continue to identify opportunities and implement innovative procedures for decreasing fugitive methane emissions.

*TransCanada's largest opportunity for GHG reductions lies in controlling emissions of methane.*





*TransCanada is evaluating new technology that would detect stress corrosion cracking in pipelines without the need for venting natural gas to the atmosphere.*



In 2004, nearly 30 per cent of methane emissions from pipelines resulted from blowdowns, when pipe sections are sealed off and natural gas is vented to allow for safe construction and maintenance work.

TransCanada's first strategy is to avoid or prevent blowdowns. Where that isn't achievable, we capture as much methane as possible and transfer it to parallel pipelines. We are also piloting an incineration project, where residual blowdown methane is burned to produce carbon dioxide, which has a far lower GHG impact than methane.

### Preventing Blowdown Emissions

**Outage Decision Model (ODM)** is used to assess and minimize the frequency and duration of all pipeline outages (service interruptions), usually by combining several repair and maintenance jobs into a single outage. TransCanada policy states that ODM must be used before any outage is performed on our pipeline network.

**Hot tapping technologies**, pioneered by TransCanada, allow a new branch pipeline to be connected to an operating pipeline. New branch lines up to 30 inches in diameter can be welded to operating pipelines up to 48 inches in diameter during full-pressure, full-flow operations. This allows work to proceed safely, without the need to vent large gas volumes in a blowdown.

**Repair sleeves** of composite fibre or steel are used to repair corrosion in pipeline sections without shutting down service or venting methane to the atmosphere. During these repairs, pipeline compression is typically reduced to 80 per cent of normal pressure.

**Valve sealing** can stop leaks in very large valves on transmission pipelines, substantially reducing the amount of natural gas that must be vented to the atmosphere in a blowdown. Valves are closed on either end of a pipeline section slated for repair. But if one of the valves is found to leak, another valve further along the line must be closed, which substantially increases the amount of natural gas that must be vented. Traditionally, such blowdown extensions could only be avoided if the valve seat was faulty and sealant could be applied. But the development of new sealants that can be applied to entire valve bodies has significantly reduced the number of cases in which blowdowns are extended due to valve leaks.

**In-line inspection tools** are being evaluated by TransCanada and GE Energy to determine if new technology can provide dependable remote detection of stress corrosion cracking (SCC) in operating pipelines. Pipeline inspection tools, called "pigs," are fitted with electromagnetic acoustic transducers (EMATs) – ultrasound systems that do not rely on a liquid medium. If successful, EMAT technology could replace conventional SCC detection methods, involving line excavations and blowdowns of natural gas to allow for hydrostatic pipeline tests using water pressure.

### Capturing Blowdown Emissions

**Portable transfer compressors** push gas out of pipeline sections scheduled for repair or maintenance into parallel pipeline sections to ensure safe working conditions. Our fleet of eight truck-mounted compressors captures most of the methane that would otherwise be vented to the atmosphere during a blowdown.



## MANAGING GHG EMISSIONS

*Air-powered expellers* remove small amounts of residual methane that remain following transfer compression. Traditionally, these expellers were powered by a stream of compressed gas from the parallel, operating pipeline system, but this involved releasing some methane to the atmosphere. Since 2000, TransCanada has used air compressors to power the expellers, avoiding another source of methane emissions.

*Incineration of methane* has the potential to reduce the GHG impacts of residual methane following blowdowns. Incineration converts methane to carbon dioxide, which has a much lower GHG impact. We are now working with vendors on incinerator design modifications that would reduce the elapsed time for incineration. This would limit the length of time that parallel lines must carry additional gas volumes – increasing compression requirements and associated emissions that tend to offset incineration benefits.

### Reducing Fugitive Methane Emissions from Leaks

Reductions in methane emissions from leaks and engineered sources are achieved through our extensive fugitive emissions management program.

Fugitive emissions from leaks result from pipeline equipment, such as flanges and valves, as well as components that are engineered to release methane as part of normal operations. Emissions of this type are continuous (24 hours/day) and account for about 70 per cent of TransCanada's total methane emissions, or seven per cent of the company's total pipeline GHG emissions. Locating and reducing emissions from these sources can potentially consume significant resources.

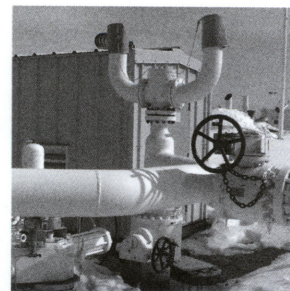
As fugitive emissions sources are eliminated each year, opportunities for savings in succeeding years are reduced accordingly.

### Detection and Measurement

*Leak Detection and Repair (LDAR)* involves identifying leaks from susceptible components, setting priorities, conducting repairs for those components that do not require pipeline outages and documenting results. This process is carried out on a rotating basis covering all TransCanada's pipeline facilities. The Fugitive Emissions Management Team is responsible for implementing LDAR work and tallying the emissions savings on a monthly basis. A central database captures all the LDAR data recorded for each facility on an annual basis. The number of facilities that undergo the LDAR process is the key business performance indicator for field operations teams and management, and is a factor in their compensation.

From accumulated experience, it has become evident that not all facilities require an annual leak detection and repair schedule. Reductions in fugitive emissions can be maintained even when some facilities are moved to leak detection and repair every two years. The LDAR program is administered through the planned maintenance program, called Avantis, and has become part of TransCanada's overall standard operating procedures.

*High-flow samplers* became the standard method of measuring fugitive emission leaks throughout TransCanada's entire pipeline network in 2004. Expanding our use of high-flow samplers was made possible due to the introduction of commercially manufactured units, which allowed TransCanada to acquire 10 high-flow samplers – enough to equip our entire pipeline maintenance group.

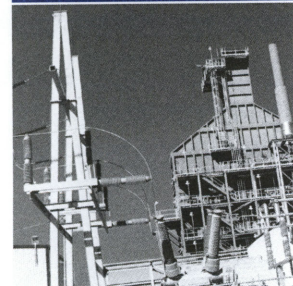


*Innovative measures for the prevention and capture of methane emissions have reduced this source of GHGs by 75 per cent since 1990.*





*High-flow samplers are the latest and best technology for accurate measurement and elimination of fugitive methane emissions.*



Standard use of high-flow samplers has important implications for TransCanada's fugitive emissions measurement program because of their speed and precision in measuring methane emissions from small leaks. To date, these units are giving us far more accurate – and lower – measurements of total fugitive emissions. They replace older methods that involved using soapy water to find small leaks, which were then “bagged” in plastic to determine flow rates.

New high-flow samplers include microprocessors for storage and downloading of data, greatly improving accuracy and efficiency of record keeping. Data from all high-flow samplers is fed into TransCanada's GeoFind database system, providing a highly accurate, system-wide picture of our fugitive emissions profile in real time.

TransCanada's experience with high-flow samplers dates back to 1996 when we helped field-test the first prototype. Since that time, we have owned the only high-flow sampler in Canada. During almost a decade of use, the high-flow prototype – about the size of a briefcase – has proven significantly faster and more accurate than bagging methods of leak measurement.

Aerial leak inspection and gas detectors are used to find leaks in buried facilities and open-ended lines such as blowdown vents, where high-flow sampling and soap-and-water detection are not practical.

## POWER

### TransCanada's Role in North American Power

TransCanada is among North America's fastest growing independent electricity producers. We own and operate more than 1,042 megawatts (MW) of installed generation capacity, with another 1,000 MW acquired or under construction in 2005.

Since entering the electricity market in the early 1990s, TransCanada has invested in high-efficiency power facilities that generate electricity using leading-edge processes and low-emissions fuels. Natural gas and waste heat are used extensively to generate electricity at our wholly owned power facilities. We also have interests in non-operated facilities and projects in development that generate some 4,500 MW of electricity using wind, nuclear, hydro and coal.

In 2005, TransCanada sold its interests in TransCanada Power, L.P., which included nine power plants. The move allows TransCanada to focus on larger projects that have long-term sales contracts for their power output. The new projects include high-efficiency, gas-fired cogeneration, wind power and hydroelectric power.

The natural gas-fired Grandview cogeneration facility was completed in December 2004 and operated throughout 2005. Power and waste heat from this 90-MW facility, located in Saint John, New Brunswick, is sold to Irving Oil Limited under a 20-year power purchase agreement (PPA).

TransCanada added 567 MW of zero-emissions hydro to its generating capacity in April 2005 with the purchase of the Connecticut River and Deerfield River hydroelectric systems from USGen New England Inc.



## MANAGING GHG EMISSIONS

The assets include generating facilities on two river systems in New England, now known as TransCanada's U.S. Northeast Hydro Systems.

In Québec, TransCanada continued to focus on cogeneration power facilities with the construction of the 550-MW Bécancour cogeneration power plant near Trois-Rivières. It is scheduled to begin operating fall 2006, and will supply power to Hydro-Québec Distribution and steam to major businesses.

About 740 MW of wind power will come on stream between 2006 and 2012 with the commissioning of six power projects in Québec. The projects represent an investment of \$1.1 billion by Cartier Wind Energy Inc., which is indirectly co-owned by TransCanada at 62 per cent, and Innergex II Income Fund at 38 per cent. The projects have long-term electricity supply contracts with Hydro-Québec Distribution. When completed, the projects' total annual production will provide the energy required to meet the electricity needs of about 150,000 households in Québec. Typically, wind power can generate electricity about one-third of the time since winds are not steady enough to produce power consistently.

### Power Quickfacts

#### Wholly Owned Power Facilities

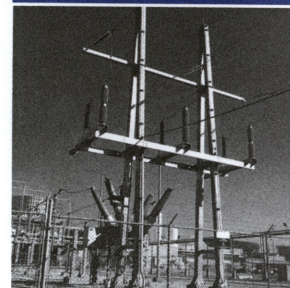
*Capacity – megawatts (MW)*

Plant	Capacity	Startup	Type
Bear Creek	80	March/03	Combined Cycle Cogeneration
<b>Bécancour*</b>	<b>550</b>	Fall/06	Cogeneration
Cancarb Power	27	Feb/01	Waste Heat Recovery
Carseland	80	Jan/02	Cogeneration
Grandview	90	Dec/04	Cogeneration
MacKay River	165	Fall/04	Cogeneration
Ocean State	560	Dec/90	Combined Cycle
Redwater	40	Jan/02	Cogeneration
<b>U.S. Northeast Hydro**</b>	<b>567</b>	April/05	Hydroelectric
Total	1,042/2,159		

\* Bécancour is currently under construction.

\*\* U.S. Northeast Hydro was purchased April 1, 2005. Assets include the Connecticut River and Deerfield River hydroelectric systems in New England.

*Wind power is a growing segment of our power portfolio.*







*Five of our power facilities are cogeneration operations that have the highest possible energy efficiency rating with current technology.*

## GHG Sources

- Natural gas-fired turbines that drive generators used to create electricity.
- Boilers at power plants.

## Energy Efficiency

Six of TransCanada's seven wholly owned, producing power generation facilities have been built within the past five years and all seven operations use some of the most environmentally responsible processes and fuels available today. Six are fuelled by natural gas, producing fewer GHG emissions than power plants that consume other fossil fuels such as coal or oil. A conventional coal-fired power plant creates about 1,000 kilograms of carbon dioxide for each megawatt-hour of electricity generated, compared with approximately 400 kilograms of carbon dioxide produced by conventional natural gas-fired power plants.

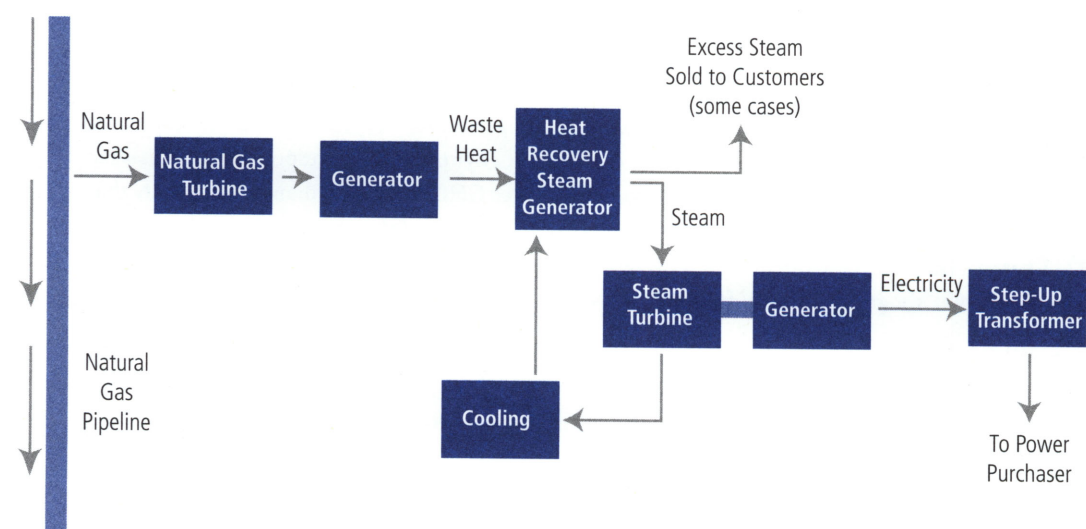
Our seventh wholly owned power facility, Cancarb, takes advantage of a unique opportunity and generates electricity almost entirely from waste heat provided by an adjoining industrial operation. Electricity generated from waste heat has a negligible GHG impact. It also fills demand for power that would typically be met by fossil fuel generators.

Five of our seven power operations are cogeneration facilities. Cogeneration facilities use natural gas-fired turbine engines to produce two commodities – electricity and waste heat – from one fuel source. Natural gas-fired turbine engines drive generators that produce electricity while waste heat from the turbine engines is captured or turned into steam. Both products can be sold to nearby industries to heat buildings or for use in various processes. Waste heat and steam can displace fossil fuels and their associated emissions.

Since waste heat and steam cannot be transported long distances, cogeneration plants must be located close to industrial clients. For example, our MacKay River power facility sells steam to a nearby oilsands operator to extract oil from the Alberta tar sands while our Redwater power facility sells waste heat to a natural gas liquids fractionation plant to extract propane and butane from natural gas.



DIAGRAM 2 – TYPICAL WASTE HEAT PROCESS USED IN TRANSCANADA POWER FACILITIES

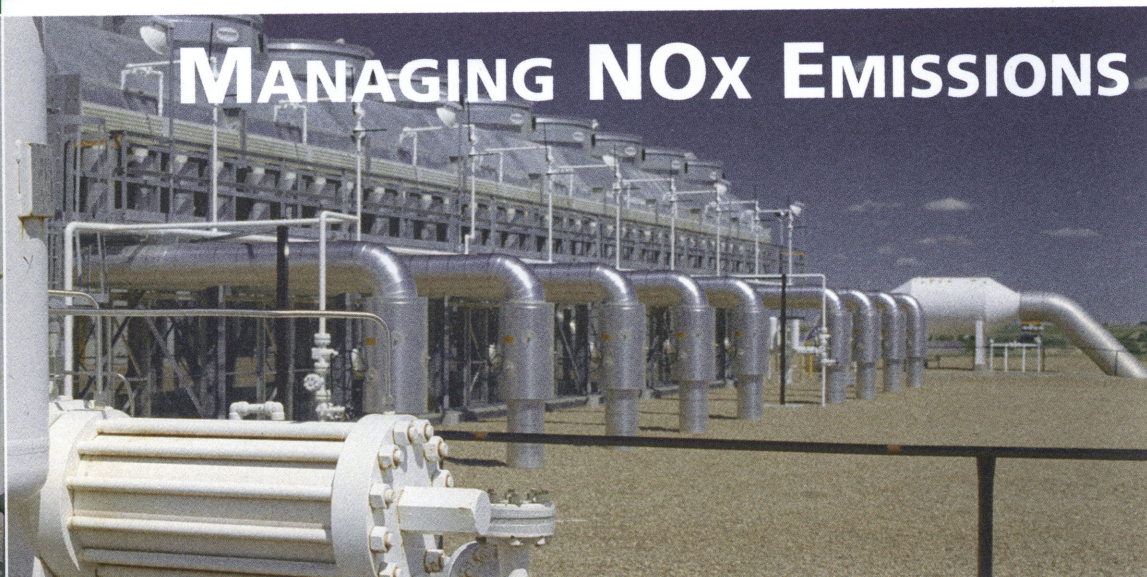


*Waste heat cannot be transported long distances, so cogeneration plants must be located close to industrial clients.*



Nitrogen oxides (NOx) are air pollutants that contribute to regional air quality issues such as smog. TransCanada annually reports NOx emissions to Canada's National Pollutant Release Inventory (NPRI).

## MANAGING NOx EMISSIONS



### PIPELINES

The combustion of natural gas consumed by our pipeline operations produces NOx.

### NOx Sources

- Natural gas-fired turbines and reciprocating engines that drive compressors used to move natural gas through TransCanada's pipelines.
- Natural gas or diesel fuel consumed by boilers required for space heating and auxiliary or backup generators in case of power interruptions at compressor stations.
- Line heaters that burn natural gas to raise the temperature of sales gas at storage and production facilities.

### Measuring NOx

On TransCanada's pipeline system, Emissions Factor Estimate (EFE) is the method used to calculate NOx emissions from natural gas-fired turbines and reciprocating engines. Emissions are estimated according to the engine type. This method results in a high estimate, since it uses the engine's highest operating temperature and related emissions. EFE is also used to determine NOx levels from stationary combustion equipment at pipeline installations.



## MANAGING NO<sub>x</sub> EMISSIONS

### Managing NO<sub>x</sub>

There are more than 300 compressor units along our 41,000-kilometre, wholly owned pipeline network. In recent years, older style reciprocating engines have been retired as necessary and only a small number remain in service. New compressors are driven by natural gas-fired turbine engines, which reduce the production of all emissions.

A number of technologies are used to prevent the formation of NO<sub>x</sub> during the operation of the turbine or reciprocating engines on our pipelines. Dry Low Emissions (DLE), Dry Low NO<sub>x</sub> (DLN) and SoLo NO<sub>x</sub> all refer to the same basic technology, which is the preferred method of NO<sub>x</sub> prevention at most TransCanada facilities. These technologies tightly control the air/fuel ratios used in the combustion process in order to reduce the flame temperature and resulting NO<sub>x</sub> formation. Water is used to reduce flame temperature and NO<sub>x</sub> formation at three compressor stations on our BC System.

## POWER

### NO<sub>x</sub> Sources

- Natural gas-fired turbines that drive generators at the majority of TransCanada's power facilities.

### Measuring NO<sub>x</sub>

NO<sub>x</sub> emissions are measured at TransCanada facilities using Continuous Emissions Monitoring (CEM), where an analyzer in the flue stack gives a direct measurement.

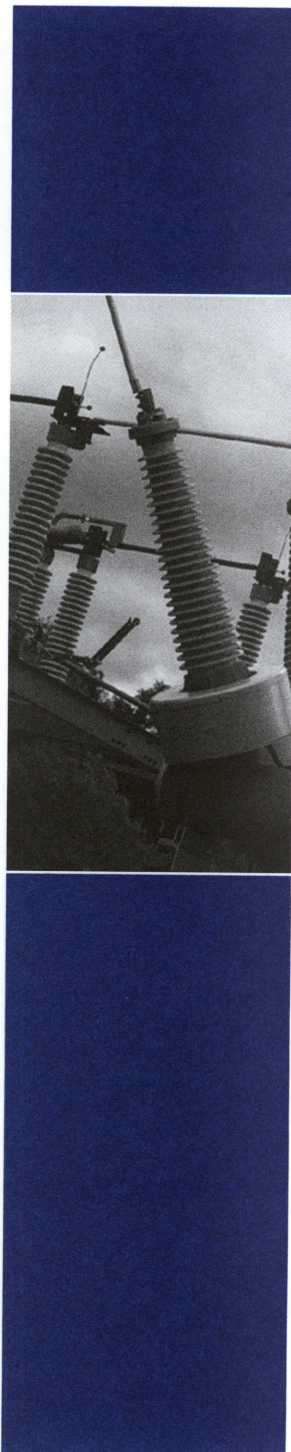
### Managing NO<sub>x</sub>

TransCanada's main objective is to prevent the formation of NO<sub>x</sub> at its power facilities through the use of low-NO<sub>x</sub> technologies. Where prevention isn't economically feasible or required by law, TransCanada manages these emissions through established cap-and-trade systems. To manage NO<sub>x</sub>, TransCanada:

- prevents NO<sub>x</sub> formation through our choice of processes for generating electricity
- uses front-end technologies designed to prevent the formation of NO<sub>x</sub>, such as DLN or DLE technology
- trades or purchases NO<sub>x</sub> emissions allowances in regions that have implemented cap-and-trade systems.

### Processes

Of our seven wholly owned, producing power plants, six have been built since 2001 and use some of the most environmentally responsible technologies available to generate electricity. Cancarb is powered almost entirely by waste heat from an adjacent industrial site, and produces near zero-emissions electricity. Five of our power





facilities use natural gas in combination with an energy-efficient process – cogeneration – which results in the cleanest fossil-fuelled electricity generation available today. Cogeneration facilities have high efficiencies that are possible because natural gas is used to create two commodities – waste heat/steam and electricity. The waste heat/steam is sold to industrial clients, where it displaces fossil fuel use in their operations.

TransCanada's five cogeneration plants incorporate the latest in turbine technology. Turbine manufacturers operate in a competitive market and are continuously improving their product in three areas: reliability, efficiency and emissions rates. Since two of the three specifications are directly linked to environmental performance, newer aeroderivative and frame-type turbines are equipped with DLE or DLN technologies. TransCanada's wholly owned power plants emit fewer greenhouse gases and less NOx per unit of output than systems fired by coal or oil.

### Prevention

Dry Low NOx, Dry Low Emissions and SoLo NOx are the main methods of NOx prevention used by TransCanada power facilities. These technologies prevent NOx formation by modifying the combustion process of gas turbines. This is accomplished by increasing the air/fuel ratio and premixing natural gas with air before it enters the combustion zone. This creates a "lean burn" mix, which reduces the flame temperature during combustion and results in significantly lower NOx levels. These methods are termed "dry" because no water or steam cooling is needed to control flame temperatures. With fewer temperature peaks, NOx formation is significantly reduced.

### Cap-and-Trade System

A cap-and-trade system for NOx is in effect in Rhode Island, where our Ocean State Power facility is located, and is currently being developed for Alberta, which is home to the majority of our wholly owned power facilities. Typically, cap-and-trade systems establish a maximum limit for company-wide NOx emissions based on various criteria. Companies that are over their NOx allocation must purchase credits from companies that produced less than their NOx allotment. Cap-and-trade systems allow for greater overall reductions in NOx than are possible through across-the-board reductions. While providing environmental benefits, cap-and-trade systems are also more economical because they allow operators facing high-cost reductions to meet government requirements by purchasing allowances or credits from operators with more cost-effective NOx reductions.

### NOx Control Issues

Some NOx prevention methods are more effective than others. However, all provide challenges to the already complex process of gas turbine combustion for pipeline and power generation facilities.

Water is limited in its effectiveness because it can't reduce NOx to low levels. Also, where water is injected, large amounts of demineralized water must be available on a continuous basis. The water itself can cause corrosion of components in the combustion system. Since the water is turned to steam in the combustion

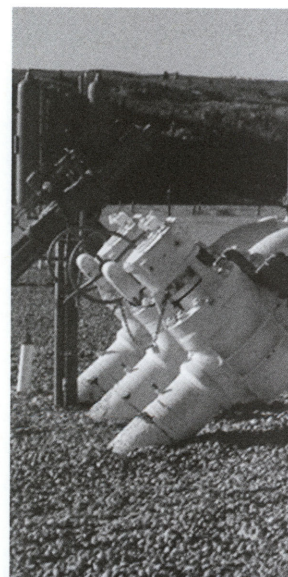
*TransCanada builds high-efficiency power facilities with temperature control technologies that limit NOx formation.*



## MANAGING NO<sub>x</sub> EMISSIONS

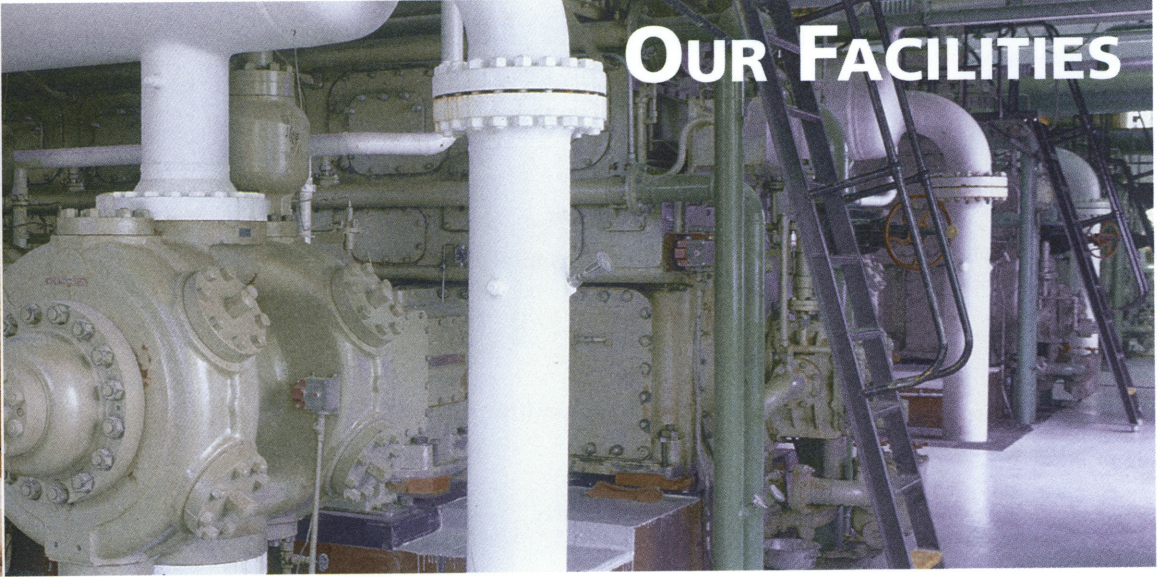
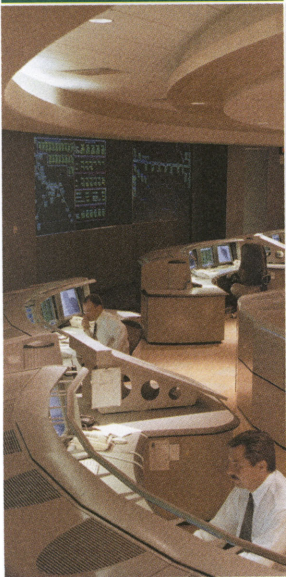
chamber, vaporization requires more fuel to be burned, affecting fuel efficiency and increasing GHG emissions. Steam causes less corrosion; however, it consumes steam that could be used to generate more electricity in combined cycle plants or sold by cogeneration plants for industrial purposes.

Dry low technologies have steadily advanced over the years, but they are not yet mature enough for many applications in terms of reliability, particularly for aeroderivative engines. Also, dry low technologies are expensive to purchase, operate and maintain and are typically used on new installations, not retrofits. Decisions to implement dry low technologies are based on legislated or regulated levels, both of which depend, to a large degree, on where the facility is located and existing issues with air contaminants.





All policies and actions in this report relate to facilities that are under the management or operational control of TransCanada. We list, but do not report on, several major pipeline and power facilities in which TransCanada holds significant interests but whose management and day-to-day operational control are provided by third parties.



## OUR FACILITIES

### FACILITIES

In this report, we detail emissions management strategies and activities for facilities wholly owned by TransCanada, as well as partially owned facilities that are managed and/or operated by us.

In addition to these large pipeline and power operations, TransCanada also holds interests in many other pipeline and power installations that are managed and operated by third parties. The map in this section of the report shows the full extent of TransCanada's holdings in Canada and the United States, while the included charts distinguish wholly owned and/or operated facilities from those managed and operated by others.



## OUR FACILITIES

### LEGEND

#### Natural Gas Transmission

Saskatchewan, Manitoba,  
Ontario, Québec

- ① Canadian Mainline System  
100% TransCanada

#### Alberta

- ② Alberta System  
100% TransCanada

- ③ Ventures LP  
100% TransCanada

#### British Columbia

- ④ BC System  
100% TransCanada

British Columbia, Alberta,  
Saskatchewan

- ⑤ Foothills Pipe Lines Ltd.  
100% TransCanada

#### Idaho, Washington, Oregon

- ⑥ Gas Transmission  
Northwest  
100% TransCanada

#### Arizona, California

- ⑦ North Baja System  
100% TransCanada

#### Oregon, California, Nevada

- ⑧ Tuscarora Gas  
Transmission Company  
1% TransCanada direct ownership;  
16.4% through TC PipeLines, LP\*

Montana, North Dakota, South  
Dakota, Iowa, Minnesota,  
Illinois, Indiana

- ⑨ Northern Border Pipeline  
Company  
10% TransCanada through TC  
PipeLines, LP

Minnesota, Wisconsin,  
Michigan

- ⑩ Great Lakes Gas  
Transmission Limited  
Partnership  
50% TransCanada

#### New York, Connecticut

- ⑪ Iroquois Gas Transmission  
System  
41% TransCanada

#### Québec

- ⑫ Trans Québec & Maritimes  
Pipeline Inc.  
50% TransCanada

Maine, New Hampshire,  
Vermont

- ⑬ Portland Natural Gas  
Transmission System  
62% TransCanada

#### Power

##### Alberta

- ① Redwater  
② Carseland  
③ Cancarb  
④ Bear Creek  
⑤ MacKay River  
All 100% TransCanada

##### Ontario

- ⑥ Bruce A  
47.9% TransCanada  
⑦ Bruce B  
31.6% TransCanada

##### Québec

- ⑧ Bécancour  
100% TransCanada  
⑨ Cartier Wind  
62% TransCanada

#### New Brunswick

- ⑩ Grandview  
100% TransCanada

#### Rhode Island

- ⑪ Ocean State Power  
100% TransCanada

- ⑫ U.S. Northeast Hydro  
Systems  
(formerly known as USGen Deerfield  
and Connecticut River Systems)  
100% TransCanada

\* TransCanada holds a 33.4 per  
cent interest in TC PipeLines, LP

#### Pending Acquisitions and Construction Projects

##### Alberta, Northwest Territories

- Ⓐ Proposed Construction –  
Mackenzie Valley Pipeline  
(proposed by producers)

##### Alaska, Yukon, British Columbia, Alberta

- Ⓑ Proposed Construction –  
Alaska Highway Pipeline  
(proposed by TransCanada)

TransCanada is pursuing two  
liquefied natural gas projects in  
Eastern Canada and the U.S.  
Northeast. We are focused on  
construction of the regasification  
terminals as well as a related  
pipeline infrastructure to  
complement and support our  
existing pipeline investments.

Construction is underway on the  
550-MW Bécancour natural gas-  
fired cogeneration plant, located  
near Trois-Rivières, Québec. All of  
the power output from that plant  
will be sold under a 20-year  
power purchase agreement (PPA)  
to Hydro-Québec Distribution.

It is scheduled to be in service by  
late 2006.

The purchase of U.S. Northeast  
Hydro assets, with hydroelectric  
generating capacity of 567 MW,  
was completed April 1, 2005.

Cartier Wind Energy, owned  
62 per cent by TransCanada, was  
awarded six projects by  
Hydro-Québec representing a total  
of 740 MW. The six projects are  
expected to be commissioned  
between 2006 and 2012.

TransCanada now owns 47.9 per  
cent of the newly formed Bruce A  
Limited Partnership, which will  
sublease the Bruce A facilities,  
composed of Units 1-4. Bruce A is  
undergoing a \$4.25-billion capital  
refurbishment and restart program  
for Units 1-4. The project will result  
in the restart of Units 1 and 2,  
which are currently idle.

Complete upgrades will extend the  
operating life of Units 3 and 4.  
Through our existing ownership of  
Bruce Power LP, we retain our  
31.6 per cent share of the Bruce B  
facilities, composed of Units 5 to 8.  
The Bruce holdings include an  
interest in a 9-MW wind power  
farm. Day-to-day operations at  
Bruce Power will not be affected by  
the new ownership arrangement.

In June 2005, the Federal Electricity  
Commission of Mexico awarded the  
Tamazunchale Pipeline Project to  
TransCanada. The project involves  
building a 36-inch-diameter natural  
gas pipeline of about 130 km from  
Naranjos, State of Veracruz, Mexico,  
to Tamazunchale, State of San Luis  
Potosí, Mexico. Construction began  
in November 2005 and the pipeline  
is expected to be in service by  
December 2006.





**Pipelines**

- Wholly and partially owned Canadian pipelines
- Wholly and partially owned U.S. pipelines including TC PipeLines, LP
- Ventures LP pipeline
- Proposed pipelines
- Union Gas
- Interconnecting hub/export point

**Power**

- TransCanada Power Plant
- Bruce Power
- Wind Power
- U.S. Northeast Hydro – Connecticut River Hydro facilities
- U.S. Northeast Hydro – Deerfield River Hydro facilities



## OUR FACILITIES

### WHOLLY OWNED TRANSCANADA FACILITIES

#### Wholly Owned Pipelines

**Length** – kilometres (km)    **Volumes** – billions of cubic metres per year (bm<sup>3</sup>/yr)

Facility	Length	Volumes	Country
Alberta	23,186	111.7	Canada
British Columbia	201	10.3	Canada
Foothills	1,040	32.5	Canada
Canadian Mainline	14,898	74.9	Canada
Gas Transmission Northwest*	2,174	5.2	U.S.
North Baja*	128	0.37	U.S.
Total Length	41,627		

\* Gas Transmission Northwest and the North Baja System were purchased in November 2004. Volumes are prorated for the two months of TransCanada ownership in 2004.

#### Wholly Owned Power Facilities

**Capacity** – megawatts (MW)

Plant	Capacity	Startup	Type
Bear Creek	80	March/03	Combined Cycle Cogeneration
<b>Bécancour*</b>	<b>550</b>	Fall/06	Cogeneration
Cancarb Power	27	Feb/01	Waste Heat Recovery
Carseland	80	Jan/02	Cogeneration
Grandview	90	Dec/04	Cogeneration
MacKay River	165	Fall/04	Cogeneration
Ocean State	560	Dec/90	Combined Cycle
Redwater	40	Jan/02	Cogeneration
<b>U.S. Northeast Hydro**</b>	<b>567</b>	April/05	Hydroelectric
Total	1,042/2,159		

\* Bécancour is currently under construction.

\*\* U.S. Northeast Hydro was purchased April 1, 2005. Assets include the Connecticut River and Deerfield River hydroelectric systems in New England.

### PARTIALLY OWNED AND MANAGED TRANSCANADA FACILITIES

#### Operated Pipelines

**Length** – kilometres (km)    **Volumes** – billions of cubic metres per year (bm<sup>3</sup>/yr)

Facility	Length	Volumes	Country	Ownership
Trans Québec & Maritimes	572	4.54	Canada	50%
Portland Natural Gas	471	1.42	U.S.	61.7%



## OUR FACILITIES

### Natural Gas Storage

**Capacity** – billions of cubic feet (bcf) **Deliverability** – billions of cubic feet per day (bcfd)

Facility	Capacity	Deliverability	Country	Ownership
CrossAlta Gas Storage	40	0.41	Canada	60%
Edson*	50	0.725	Canada	100%

\* Edson natural gas storage facility near Edson, Alberta, is currently being developed and expected to be in service in the second quarter of 2006.

### OTHER INTERESTS (MANAGED AND OPERATED BY THIRD PARTIES)

#### Pipelines

**Length** – kilometres (km) **Volumes** – billions of cubic metres per year (bm<sup>3</sup>/yr)

Facility	Length	Volumes	Country	Ownership
Great Lakes	3,387	22.90	U.S.	50.0%
Iroquois	663	10.02	U.S.	41.0%
Northern Border*	2,010	24.14	U.S.	10.0%
Tuscarora**	386	0.71	U.S.	17.4%
Gas Pacifico	540		Argentina	30%
TransGas	344	0.51	Colombia	46.5%
Total	7,801			

\* TransCanada indirectly owns 10 per cent of Northern Border through its 33.4 per cent interest in TC PipeLines, LP.

\*\* TransCanada has 1% direct ownership in Tuscarora and 16.4% through TC PipeLines, LP.

#### Power Plants

**Capacity** – megawatts (MW)

Facility	Capacity	Type	Country	Ownership
Bruce A	1,400	Nuclear	Canada	47.4%
Bruce B	950	Nuclear and Wind	Canada	31.6%
Cartier Wind	458	Wind	Canada	62%
Sundance A*	560	Coal	Canada	100% PPA
Sundance B*	353	Coal	Canada	50% PPA
Sheerness*	756	Coal	Canada	100% PPA
Total	4,477			

\* TransCanada holds three long-term power purchase agreements (PPAs) to buy and resell power from these facilities but holds no ownership in the plants.

In these non-operated facilities, generating capacities shown are net to TransCanada as determined by percentage of ownership.





For more information on the 2004  
Climate Change and Air Issues  
Annual Report, please contact:

Marilyn Carpenter  
Manager, Environment  
Telephone: (403) 920-7385  
or visit us at  
[www.transcanada.com](http://www.transcanada.com)

#### CREDITS

Co-ordination: Matthew Bower  
Writing: Pat Devlin & Brian Burton  
Design/Production:  
Mauritz Flinkfelt

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employees who provided ideas,  
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JANUARY 2006



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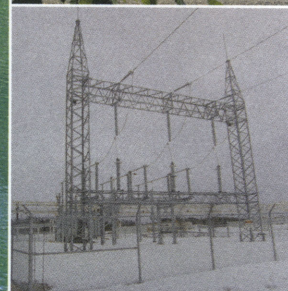
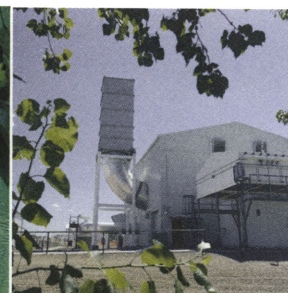
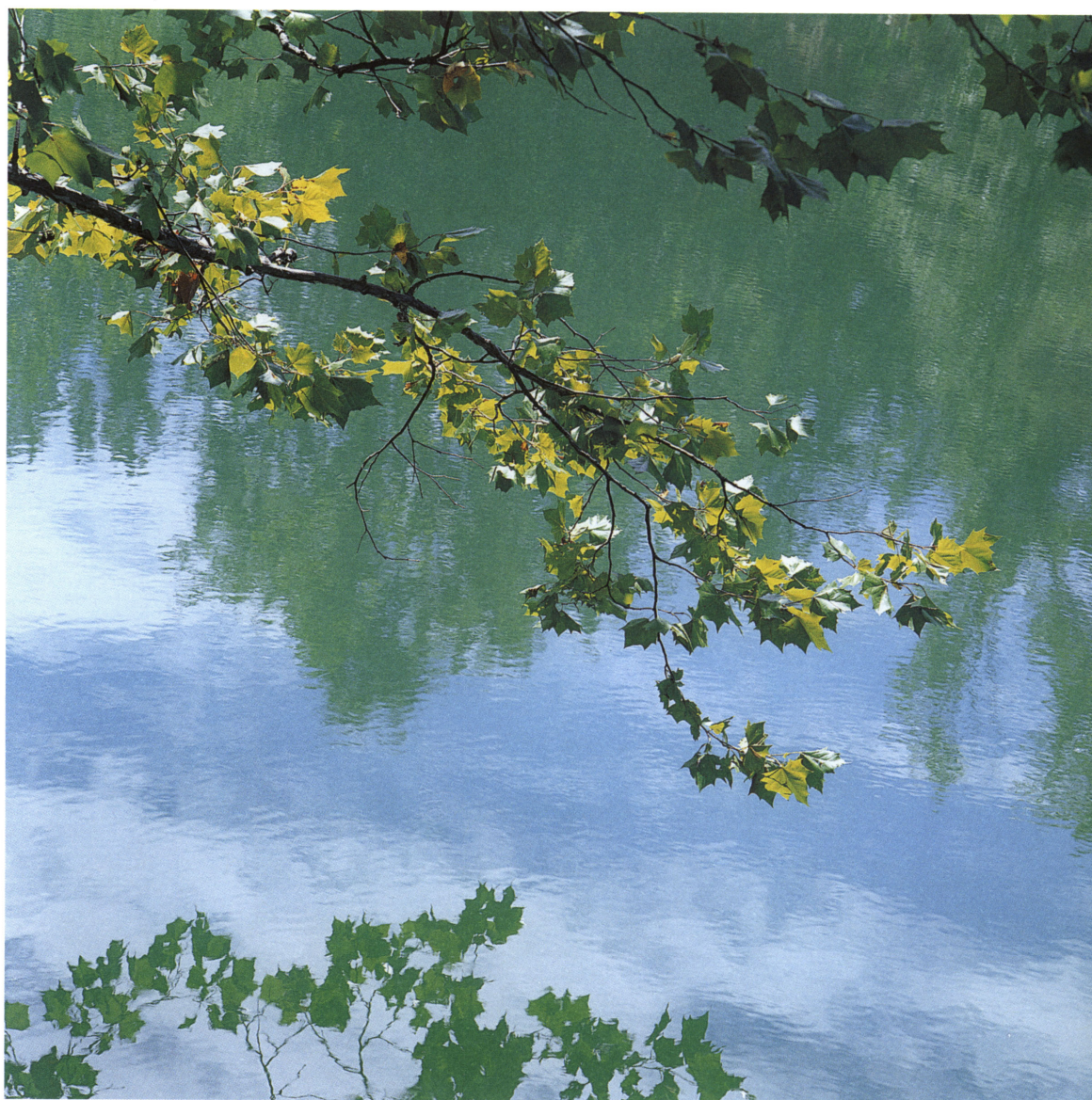
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As a result, the Company saved:

- 20 trees
- 367 pounds of solid waste
- 3,458 gallons of water
- 4,686 BTUs of energy (in 000s)
- 23 pounds of water borne wastes
- 711 pounds of atmospheric emissions

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climate change

air issues

**TransCanada** 450 - First Street SW, Calgary, Alberta, Canada T2P 5H1

Tel: (403) 920-2000      [www.transcanada.com](http://www.transcanada.com)      toll-free 1-800-661-3805

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