MINIMIZING OUR FOOTPRINT

ENVIRONMENT

TransCanada has a long-standing commitment to protecting the environment where we work and live. We work hard every day to responsibly manage and minimize our environmental footprint in everything we do – whether it's designing, building or operating energy infrastructure.

KRISTINE DELKUS
Executive Vice-President,
Stakeholder Relations and General Counsel

ENVIRONMENT HIGHLIGHTS

- Cumulative decrease of 665 metric tonnes of CO_2 emissions by our Aviation team as a result of flying at higher altitudes to reduce inflight fuel burn since 2007; enough to offset the emissions from the energy use of **an average home for over 50 years. This is one small example of how we take into consideration the carbon intensity of our operations** within our business decision-making process.
- 40,000 plants relocated along our Mexico Topolobampo pipeline right of way since the project began, ensuring the preservation of ecosystems along the entire pipeline and exemplifying our commitment to leave the land in a condition equal to or better than we found it.
- 12.3 million pieces of paper saved since the implementation of our various printing initiatives. A stack of all the paper saved would be the equivalent height of almost three Empire State Buildings stacked vertically.
- $6.8 million in cost benefits from environment-related research and development initiatives in 2014[1].
- $5 billion invested in emission-less energy sources – including nuclear, wind, hydro and solar – accounting for over one-third of the power we produce.
- In 2015, TransCanada worked collaboratively with and donated $1.4 million to 68 non-profit environmental organizations to conserve important habitat, protect species at risk and educate individuals about the importance of the environment.

1 Most recent year for which data is available.

At TransCanada, we are **committed to protecting the environment**. Not just because we have to, but because we want to.

Our material issue of Environmental Stewardship, Protection and Performance is represented in three sections that follow – Environmental Stewardship, Environmental Protection, and Environmental Performance.

TRANSCANADA'S ENVIRONMENT STRATEGY

We recognize that how we interact with the environment is of vital importance to you. It is to us, too. We believe that excellence in environmental practices is vital to the well-being of people everywhere and is essential to all aspects of our business. That's why TransCanada's Environment Strategy reflects our long-term corporate culture when it comes to environmental stewardship, protection and performance. It guides our decisions every day when designing, building and operating energy infrastructure.

Environmental Stewardship means considering our corporate values of responsibility, innovation, integrity and collaboration in every interaction we have with the environment.

Environmental Protection is about developing and maintaining environmental policies and management systems that help us preserve the integrity of the environment and sustainability of our operations.

Environmental Performance is a reflection of our efforts in stewardship and protection. It's how we systematically measure and communicate our environmental work proactively and transparently.

Our Environment Strategy goes beyond simply complying with all applicable environmental laws and regulations; we strive for excellence at every level of the organization.

As one of North America's leading energy infrastructure companies, we respect the diversity of the landscapes where we operate and consider the environmental and cultural aspects of our business activities while fulfilling our obligation to meet the continent's growing demand for safe and reliable energy.

We strive to be leaders in the development of a balanced and sustainable energy future – and our Environment Strategy is a road map to help us ensure our operations and activities are sustainable for decades to come.

ENVIRONMENTAL STEWARDSHIP

Environmental Stewardship means **considering our corporate values** of responsibility, innovation, integrity and collaboration **in every interaction we have** with the environment.

ENVIRONMENTAL STEWARDSHIP THROUGH COLLABORATION

Collaboration and relationship-building are at the heart of our environment strategy. We develop strategic environmental partnerships and advocates to help us solve issues and promote solutions. We ensure environmental commitments made to our stakeholders are viewed as requirements. Our partners in environmental collaboration include our employees, industry partners, Indigenous peoples, communities and regulators.

Collaborating with our Employees

Our employees are dedicated stewards of the environment. TransCanada's environmental governance process applies to all employees and is integrated throughout all lines of business in all jurisdictions. In addition to engaging employees in our commitment to the environment through formal governance processes such as our HSE Management System and Environmental Management Program, TransCanada actively engages employees through extensive communication and education initiatives. Our Environment Week speaker series – which educates our employees on the current, relevant and critical environmental issues that affect our business and how TransCanada manages these issues – engaged over 1,900 employees in 2015.

ENVIRONMENTAL COLLABORATION – IN ACTION

Protecting Diamond Willow Fungus

Imagine learning that the fungus that grows on diamond willow trees, used by First Nations to ease the suffering of those with headaches, migraines, respiratory issues and earaches, was in the path of a proposed pipeline project.

"That's exactly what we found when constructing on the Saturn portion of the Groundbirch pipeline in 2012 that crossed traditional territories of Aboriginal communities east of Chetwynd," says Shelly Cairns, TransCanada's senior manager, Canada Indigenous Relations. "And because of TransCanada's commitment to working with Aboriginal communities, during construction, community members identified the sensitivity of the area with the construction team and we were able to preserve the diamond willow fungus by boring under the trees."

Recognizing that the diamond willow fungus had an important cultural significance to the community, TransCanada and the Aboriginal community were able to find a solution that kept the pipeline route intact and avoided adverse effects to the diamond willow fungus by using a technique known as a road bore. This technique is used when an area is designated as too sensitive to excavate. Beginning in an area where excavation was possible, the pipe was drilled horizontally at an appropriate depth, allowing it to run underneath the stand of diamond willow trees, avoiding any disturbance.

The pipeline now runs below the habitat of the diamond willow trees. The sensitive area was left undisturbed, and the cultural and medicinal importance of the area was sustained.

TransCanada spoke to the collaborative protection of the diamond willow fungus during regulatory hearings for the North Montney project in 2014 as a positive example of how we responded to an Aboriginal community concern during construction and came up with an innovative mitigation measure to protect an area of cultural significance to the satisfaction of the community.

Read more on TransCanada's blog at blog.transcanada.com.

Collaborating with Industry Partners

We recognize there is strength in numbers and we seek outside perspective and input to resolve environmental issues and advance best practices. To avoid working in a vacuum, we participate in a number of industry and multi-stakeholder initiatives and associations.

Through our Environmental Management Program, we continually monitor our facilities to ensure compliance with all environmental requirements. We also routinely monitor proposed changes in environmental policy, legislation and regulation, and, where the risks are potentially large or uncertain, we comment on proposals independently or through industry associations.

NATURE CONSERVANCY OF CANADA – MIRAMICHI SALMON PROJECT

For over a decade, TransCanada has supported the Nature Conservancy of Canada (NCC) – Canada's leading land conservation organization – donating over $2.7 million to the organization. **Most recently, TransCanada made a $120,000 donation to help the NCC protect more than 2,100 acres** (850 hectares) of ecologically significant habitat along the Southwest Miramichi River of New Brunswick. This important watershed is world-renowned as the site of North America's largest run of Atlantic salmon and is home to fish nurseries.

Collaborating with Indigenous Peoples

TransCanada recognizes and respects the rights of Indigenous peoples and their distinct relationship with the land. TransCanada seeks to understand how our activities may affect Indigenous communities and believes that it is important to integrate traditional knowledge into our environmental planning. TransCanada is committed to working with Indigenous communities to minimize potential adverse effects and find mutually beneficial solutions.

Collaborating with Communities

We work closely with our communities to ensure their environmental concerns are heard and that we are supporting environmental initiatives that matter most to them.

As an example, since Energy East was announced in 2013, our teams have worked closely with communities along the proposed 4,600-kilometre (2,850-mile) route. We amended our project application in late 2015 to include over 700 route and scope changes to avoid sensitive environmental areas as a direct result of listening to stakeholders.

We also work with national and local organizations to conserve important habitat, protect species at risk and educate individuals about the importance of the environment. In 2015, TransCanada worked collaboratively with and donated $1.4 million to 68 non-profit environmental organizations to conserve important habitat, protect species at risk and educate individuals about the importance of the environment.

ENVIRONMENTAL STEWARDSHIP THROUGH INNOVATION

We invest in research and development to encourage environmentally beneficial technologies and techniques. The pipelines, oil and gas storage facilities and power plants owned and operated by TransCanada are among the most technologically advanced in the industry. TransCanada has played a key role in advancements related to reducing the environmental impacts, not only of our own activities but across the industry.

TransCanada's development of the Two-Stage Supersonic Ejector exemplifies an R&D success in reducing emissions and is also an environmental initiative which has generated additional revenues for TransCanada. The system, which TransCanada patented, has been licensed to a third-party manufacturer from which TransCanada receives royalty payments. TransCanada has received a number of prestigious awards for developing this innovative device that fits into compressors to capture and recycle 100 per cent of the fugitive emissions that would have been normally vented into the atmosphere, thus reducing greenhouse gas emissions and increasing energy efficiency.

In 2014, the most recent year for which data is available, TransCanada recorded a savings of $6.8 million from environment-related R&D initiatives which, in addition to providing a cost savings to TransCanada, significantly reduced our impact on the environment. These initiatives include the development of a mathematical model to quantify site contamination, reducing the need for invasive testing and extensive site remediation; research supporting the effective management of creosote tiles; and a non-invasive, water-free electronic alternative to the hydrostatic testing of pipelines.

ENVIRONMENTAL STEWARDSHIP THROUGH ENVIRONMENTAL RESPONSIBILITY

Minimizing Our Environmental Footprint

As part of our commitment to environmental stewardship, we work to minimize our environmental footprint as we strive to meet the energy needs of North Americans. We're committed to protecting the environment throughout the complete life cycle of our assets, from business development to project planning and design, through construction and reclamation to operations and final decommissioning.

Photo at right: About a year after construction of the Keystone Pipeline, this land in Nebraska was back to producing healthy crops. We believe in leaving the land just the way we found it.

We received a 2015 Environmental Performance Award by the American Petroleum Institute (API) for having the best performance record in the large-operator category.

DOING THE RIGHT THING

SIGNIFICANT FINDS ON PROJECTS

Examples of significant finds on TransCanada projects include:

- A 7,000-year-old bison kill site above the Battle River in central Alberta
- An extremely rare collection of over 200 Clovis artifacts dating back 13,000 years near Lily Lake, B.C.
- A postclassic period (approximately AD 900 to 1500) residential and ceremonial site in the mountainous Sierra Gorda region of Mexico once inhabited by a diverse mix of cultures represented by both the Huasteca and Metztitlán regions of Mexico

When sites or artifacts are discovered during construction, all construction activities at that location cease until the proper authorities are notified, mitigation is implemented as appropriate, and approval to proceed is granted. **TransCanada collaborates with Indigenous communities in the management of these sites** and, when circumstances require, we reroute our pipeline to ensure preservation of the archeological site.

Land and Biodiversity

TransCanada operates over 70,000 kilometres (43,500 miles) of the industry's safest and most efficient natural gas and liquids pipelines across many different geographic and ecological zones in North America. These pipelines deliver the energy that millions of North Americans rely on every day, and we are committed to adding to this infrastructure to meet the world's growing demand for energy.

At TransCanada, we believe that when we build an asset, we temporarily borrow the land.

To minimize effects of our projects on the surrounding environment, TransCanada completes a detailed environmental assessment. Depending on the type and scale of the project, the environmental assessment may include extensive field studies which examine existing natural resources along our proposed project footprint, such as vegetation, soils, wildlife, water resources and wetlands, protected areas and land use. Also integral to the environmental assessment process – and in keeping with our commitment to collaboration – is TransCanada's engagement with Indigenous communities, landowners, local residents and other stakeholders to identify and understand their use of the lands and any additional unique environmental concerns.

Information gathered from the environmental assessment is used in design considerations, including pipeline route selection and facility site selection, and to inform project-specific environmental protection plans. In order to further avoid environmental impacts, existing linear disturbances and previously established corridors are followed wherever practical.

Environmental assessments conducted in support of our pipeline developments provide opportunities for the identification and study of heritage resources – archeological sites, historical sites and paleontological sites (fossils) – across large areas. Significant heritage resource finds have been recovered during TransCanada assessments, providing significant insight to scientific communities, Indigenous peoples and the general public.

TransCanada has a long-standing commitment to protecting the environment where we live and work. Once our projects are constructed, TransCanada reclaims the land to maintain equivalent land capability and re-establish the land's biodiversity. Over the course of our 65-year history, TransCanada has successfully reclaimed hundreds of thousands of acres of land in many different ecological regions following pipeline construction and other facility construction throughout North America.

Our commitment to the protection of the land does not end with successful reclamation after construction. Post-construction monitoring is conducted to confirm the effectiveness of mitigation strategies, reclamation and habitat restoration activities. During operations and throughout the life of our assets, TransCanada follows a comprehensive environmental governance process anchored by an environmental management program and continues to collaborate with landowners, communities, Indigenous peoples and other stakeholders, respecting the cultural and environmental aspects of the lands we operate within.

Waste Management

TransCanada is committed to the proper management of waste materials in order to protect human health and the environment. TransCanada employs a comprehensive waste management process across all business areas and jurisdictions.

We endeavour to do business with companies and contractors that share our commitment to the environment and we regularly assess their performance. TransCanada's waste contractors are managed through a rigorous procurement, full life cycle management process. The process includes a safety, technical and quality pre-qualification to ensure contractors meet TransCanada's industry-leading safety standards and possess the technical expertise and quality infrastructure to manage our waste in full compliance with all regulatory and TransCanada requirements.

A large number of waste materials, including used batteries and lube oil, are recycled. Used pipe and other waste metals, after being vetted through strict company procedures, are normally able to be recovered as scrap and repurposed.

CLIMATE CHANGE AND ENERGY EFFICIENCY

Climate Change – Our Commitment

Climate change is at the forefront of environmental interests at TransCanada. As an energy infrastructure company, we recognize our role in the larger energy system, including our own emission of greenhouse gases (GHGs). We're doing our part to manage our GHG emissions through the programs and initiatives we have in place that meet, and often exceed, regulatory requirements.

TransCanada has had a climate change strategy for many years. TransCanada is committed to the management of climate issues across our operations. We have established lines of accountability and responsibility for climate change throughout our organization. Updates on the company's initiatives to manage GHG emissions are presented to TransCanada's health, safety and environment committee of the board. Our president and CEO, Russ Girling, who also sits on the Board of Directors of TransCanada, holds the highest level of direct responsibility for climate change issues. Additional responsibilities are divided among TransCanada's main areas of business.

TransCanada recognizes stakeholder concerns related to increasing GHG emissions and the need for sensible public policy frameworks focused on managing emissions. To that end, we engage with policy-makers, participate in industry association working groups and fund research organizations that disseminate public work on climate change.

Our commitment to a unified North American response to climate change issues is exemplified by our participation as a founding partner in the U.S. Environmental Protection Agency's (EPA) new Natural Gas STAR Methane Challenge Program, launched in March 2016. The Natural Gas STAR Methane Challenge Program is intended to spur near-term, widespread implementation of methane mitigation activities across the oil and natural gas value chain. As a founding partner, TransCanada has made a commitment to implement an industry-leading best management practice across our operations within five years to address emission sources specified by the program. Program partners will report on their progress annually and this data will be publicly released on the EPA program website. More information is available online through the EPA's website at www3.epa.gov/gasstar.

REDUCING AND RECYCLING

We continue to seek opportunities to reduce our waste generation and to recycle waste materials. **In early 2016, our head office building in Calgary upgraded to a more comprehensive recycling program** to align with the City of Calgary's goal of 80 per cent waste diversion from city landfills. In April 2015, our Coolidge Generating Station implemented an Arizona Department of Environmental Quality-approved Pollution Prevention Plan (P2), with the goal of reducing its solid waste generation by implementing a recycling program. **The goal of the P2 plan is to reduce the solid waste generated at Coolidge by one per cent each year.** Coolidge is on track to reduce the solid waste generated by three per cent during the first year of the plan's implementation.

ENVIRONMENTAL STEWARDSHIP – IN ACTION

Partners in wildlife protection

When a grizzly bear saunters through a pipeline right of way (ROW), what does it do? Does it avoid the area, or does it prefer it? Does it use the area for feeding, travel or anything else?

Those are the questions that Mike Wilfley on TransCanada's environment team has been monitoring for several years as part of our involvement with a Foothills Research Institute (FRI) study. While study of grizzly bears led by FRI has spanned over 16 years, the past few years have focused more specifically on grizzly bear response to unique linear features, like pipeline ROWs.

"The objectives of this specific study were to summarize what has been learned in terms of how these bears interact with ROWs and if they're influenced by the food and landscape they find there," says Wilfley, a biologist with 21 years' experience studying flora and fauna in the field who joined TransCanada two years ago. "In particular, it puts years of observation into a context that helps us plan our projects."

TransCanada invests heavily in research to better understand and minimize the impacts of pipeline ROWs on sensitive wildlife species, such as grizzly bears and caribou. The combination of industrial development, forest fires, habitat fragmentation and induced predator-prey interaction are believed to be factors contributing to declining boreal populations in Canada of woodland caribou, a federally listed species at risk. Co-ordinated effort to restore caribou habitat is key to facilitating the recovery of caribou populations.

In collaboration with the Government of Alberta and other key partners, TransCanada implemented measures to restore the quality and connectivity of more than 247 acres (100 hectares) of critical caribou habitat in the newly proposed Dillon River Wildland Park. Abandoned seismic lines and roads not used for recreational and traditional purposes were blocked with coarse woody debris and re-planted with native tree species to enhance disturbed habitat and restore ecological function.

"When TransCanada started planning pipeline projects in northern Alberta, we identified a need to offset residual effect on woodland caribou habitat," says Kim Ogilvie, manager of Canadian environmental planning and permitting. "So, we entered into what some might call an unlikely partnership with Alberta Pacific Forest Industries Inc. and Alberta Environment and Sustainable Resource Development to create a collaborative, restoration project that would align to Alberta's woodland caribou policy priorities and federal caribou recovery strategies."

"We each had our own interests, but we bonded over the notion that the caribou story starts with shared objectives – take action, work together and leverage resources to ensure that restoration investments are meaningful," adds Ogilvie.

As part of our commitment to environmental stewardship, TransCanada continues to participate in co-ordinated caribou habitat restoration, applied research and effective monitoring where our operations overlap with boreal caribou habitat.

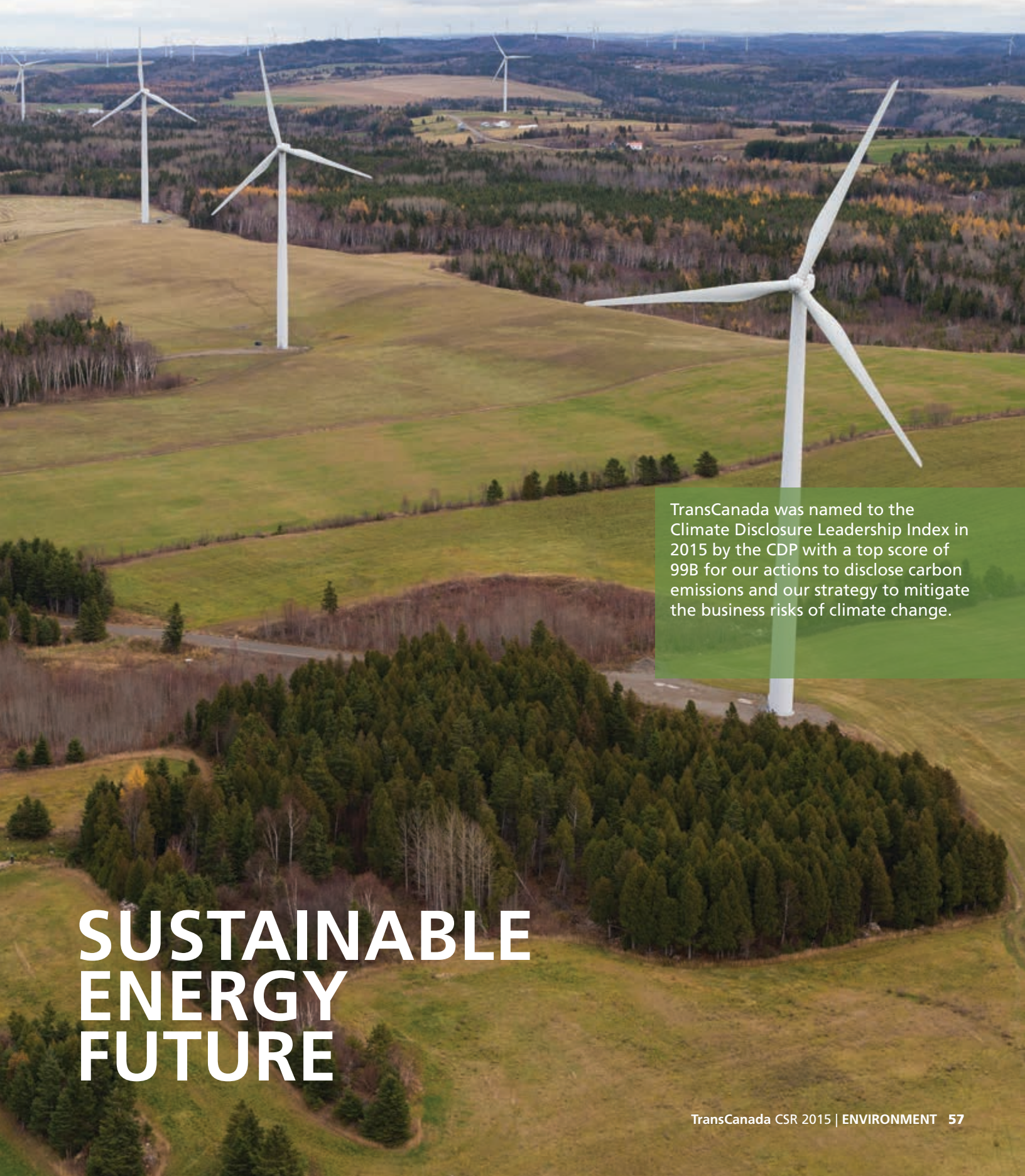
Read more about grizzly bear research and caribou habitat conservation on TransCanada's blog at blog.transcanada.com.

TransCanada has publicly documented climate change-related activities for nearly 20 years. We have voluntarily reported to the London-based CDP (formerly the Carbon Disclosure Project) since 2006. In 2015, TransCanada received an industry-leading score of 99B on the CDP Climate Disclosure Leadership Index (CDLI) by disclosing high-quality carbon emissions and energy data through CDP's climate change program. Since 2012, TransCanada has been among Canada's top CDP-scoring companies and named to the country's CDLI.

Improving Efficiency and Reducing Emissions

TransCanada's commitment to reducing emissions and improving efficiency isn't new. For over half a century, we have tested promising new technologies to minimize fugitive emissions and reduce emissions and fuel consumption of our pipeline compressors.

Photo at right: The Cartier wind facilities in Québec provide enough clean energy to power more than 100,000 homes.



TransCanada was named to the Climate Disclosure Leadership Index in 2015 by the CDP with a top score of 99B for our actions to disclose carbon emissions and our strategy to mitigate the business risks of climate change.

SUSTAINABLE ENERGY FUTURE

INNOVATION REDUCES ENVIRONMENTAL IMPACT

TransCanada's advancement of Electromagnetic Acoustic Transducer (EMAT) technology, a non-destructive in-line inspection tool that uses sound waves to detect defects in steel pipelines, has allowed EMAT to be used as an alternative to the hydrostatic testing of pipelines, eliminating impact to water sources and resulting in considerable cost savings. TransCanada continues our work on this important innovative initiative as part of our commitment to protecting the environment.

For instance, in 1964 we introduced the pipeline industry's first Rolls-Royce Avon turbine – derived from Rolls-Royce's Avon turbojet – in an Ontario compressor station. Over 50 years later, TransCanada operates the biggest fleet of industrial Rolls-Royce engines in the world, and the partnership continues with ongoing research into even higher efficiency turbines.

General Electric (GE) is another long-time partner with TransCanada in improving efficiency for TransCanada's power generation facilities. In 2012, TransCanada replaced key turbine parts at our Ravenswood generating station in New York City and Mackay River cogeneration facility in Alberta with new components made from advanced materials developed for GE jet engines. These efficiencies are translating into more reliable power generation and rate competitiveness for customers, including providing New York City with 20 per cent of its power from the Ravenswood generating station.

In 2014, using key industry insights from TransCanada, GE announced the launch of a new 16.5 megawatt gas turbine, developed to meet the oil and gas industry's evolving challenges. The NOVALT16 gas turbine raises the standards of efficient and reliable pipeline compressions, power generation and oil and gas plant compression applications, thereby helping to meet increasing energy demand across the world. Development and testing of the NOVALT16 engine began in 2013. TransCanada is encouraged by this technology and intends to pilot the use of it at one of our northern Alberta compressor stations in late 2017. We are hoping to see NOVALT16 move TransCanada further down that sustainability continuum.

Focusing our R&D dollars on improving efficiency is another way TransCanada has continued to invest in the long-term sustainability of our operations. Please see the Research and Development section on page 23 for more information.

Investing in a Balanced Energy Future

Our commitment to transition to a balanced energy system also extends to our business development decisions.

With our extensive experience building, operating and investing in diverse power generation technologies, fuel types and commercial structures, we can actively participate in supporting the energy shift from coal-fired generation to natural gas, nuclear and renewables. Our growing investment in natural gas, nuclear, wind, hydro and solar generating facilities demonstrates our commitment to clean, sustainable energy. To date, TransCanada has invested more than $5 billion in emission-less energy sources, accounting for over one-third of the power we produce.

As an example, we are playing a key role in Ontario's successful elimination of coal-fired power generation through our 48.5 per cent ownership of the Bruce Power nuclear facility. In 2015, we entered into an agreement with the Ontario Independent Electricity System Operator to extend the operating life of the facility to 2064. This agreement secures reliable, affordable, emission-less power for Ontario residents for many decades to come.

See the About TransCanada section on page 9 for more information on our energy assets.

WATER

TransCanada recognizes water and water systems as a fundamental component of the ecosystems where we operate. The protection of our water resources is of the utmost importance to both the environment and our business.

TransCanada has a responsible relationship with water on many levels – for example, pipeline watercourse crossings create temporary interactions with aquatic environments during construction, we borrow fresh water during the hydrostatic testing of the integrity of our pipelines, we utilize water as a coolant and essential component of the power generation process at our power facilities, and we harness the energy of falling water to create electricity through our extensive hydroelectric system.

In accordance with all applicable regulatory requirements and environmental assessment processes, TransCanada identifies and characterizes water-related issues in the planning and permitting stages of asset development. When a potential exists for our proposed facilities or infrastructure to interact with natural water resources, evaluations are conducted to understand the full nature and extent of the interactions. Specific plans are developed and implemented to ensure all resources are protected to maintain their natural function within the environment. Water is responsibly managed by our operations through a comprehensive environmental management program.

Watercourse Crossings

Information is gathered about all watercourses crossed by our projects. The information gathered during these surveys, in combination with provincial, state and federal guidelines and input from engagement activities, is used to determine the most appropriate method of installing a pipeline at a watercourse crossing.

Given the sensitivity of the aquatic environment, prescriptive mitigation is put in place to minimize the impact of construction and operations activities. A key mitigation is the selection of an appropriate pipeline installation method for the watercourse crossing. The most appropriate technique for each watercourse crossing is chosen according to a defined set of criteria, including the presence of sensitive and critical fish habitat, with the objective of achieving no net loss of fish habitat. Disruption of sensitive life stages (i.e., spawning, fry emergence) is avoided by timing construction outside of any restricted activity periods.

Other information gathered to help develop site-specific mitigation, aid in the protection of sensitive areas and minimize erosion and sedimentation includes:

- Riparian habitat quantity, quality and restorative ability
- Stream morphology, discharge and velocity
- Terrain stability

Protection of these sensitive areas is also accomplished by limiting clearing and grading, adjusting the width of the right of way and through habitat reclamation programs.

Watercourse crossing methods are industry-proven construction techniques that are typically grouped into three categories:

- Trenchless – these methods do not involve in-stream work to install the pipe. Horizontal directional drilling is a common trenchless method.
- Isolated crossing – using either a flume or dam and pump system, the water is diverted over or around the excavation.
- Open cut – generally used when a watercourse is dry or frozen to the bottom, has limited fisheries value or as a contingency crossing method for large river crossings.

TransCanada takes extra precaution around bodies of water for our oil pipelines, implementing thicker walled, reinforced steel pipe and shut-off valves on both sides of the waterway that can isolate an incident area within minutes to limit the impact of a potential spill.

As part of TransCanada's post-construction reclamation and monitoring program, a variety of assessments are conducted to evaluate factors such as terrain stability, soil productivity, erosion sediment controls and riparian vegetation to ensure the re-establishment of equivalent land capability after construction.

Hydrostatic Testing

TransCanada borrows fresh water from water sources to hydrostatically test the integrity of our pipelines. This process is subject to a prescriptive environmental management process. All water used in the hydrostatic testing of our pipelines is tested, treated if required and returned to the environment in compliance with all applicable regulations.

Water in Power Generation

Our various non-hydroelectric power facilities use water in various ways – to generate steam to create electricity and as a coolant in plant processes. When water is used, it is sourced from fresh water, sea water or groundwater sources. The use of water in power generation processes is subject to a prescriptive regulatory, governance and best management framework. When water is returned to its

source or discharged to the environment, it has been rigorously tested to meet or exceed all discharge criteria. TransCanada's Ocean State Power, Ironwood and Coolidge generating stations utilize a zero-liquid-discharge water treatment system to eliminate any process water discharges to the environment.

Our hydropower assets have a very intimate relationship with water sources, harnessing the raw power of water in the natural environment to create electricity. The water we borrow in our hydropower process is a precious shared resource and TransCanada takes industry-leading measures to ensure its protection. We have achieved a Low Impact Hydropower Institute (LIHI) certification for the bulk of our hydroelectric generation in New England. LIHI is a non-profit organization dedicated to reducing the impacts of hydropower generation through the certification of hydropower facilities that have avoided or reduced their environmental impacts. The LIHI certification program is intended to protect multiple ecosystem components, including river flows, water quality, fish and wildlife, as well as meet recreation and cultural preservation needs. In order to be certified, a hydropower facility must pass the LIHI low impact standard for each of these ecosystem components, with criteria based on the most recent and most stringent state and federal mitigation measures.

ENVIRONMENTAL PROTECTION

We preserve the integrity of the environment through a comprehensive management system. This system is driven by an integrated Health, Safety and Environment Commitment Statement and an environmental management program that guides the proactive management of our risks and requirements.

See the Management Systems section on page 10 for more information on the management systems, programs and procedures that enable TransCanada to ensure compliance with regulatory requirements and support development and adoption of best management practices across all lines of business and assets.

ENVIRONMENTAL PERFORMANCE

At TransCanada, we systematically measure and communicate our performance in a proactive and transparent manner. We are committed to continuously improving our environment performance.

Please see Recognition on page 9 for examples of TransCanada's achievements in environmental, social and economic performance.

Indirect Greenhouse Gas Emissions

Indirect GHG emissions are disclosed in our CDP reports, publicly available at www.cdp.net.

GREENHOUSE GAS EMISSIONS

DIRECT GREENHOUSE GAS EMISSIONS (tCO_2e)[1]

	2012	2013	2014	2015
Natural Gas Pipelines	6,000,000	7,100,000	7,400,000	7,300,000
Liquids Pipelines	0	0	0	0
Power	6,300,000	5,100,000	5,300,000	5,700,000
Total	12,300,000	12,200,000	12,700,000	13,100,000

1 tCO_2e = tonnes of carbon dioxide equivalent.

Note: Numbers may not add up due to rounding. TransCanada's direct GHG emissions reporting boundary is based on an asset equity share. Our oil storage assets and liquids pipelines are below direct GHG reporting thresholds. The TransGas Natural Gas Pipeline System (in Colombia) is excluded. Coal combustion is the main source of GHG emissions at the coal-fired power plants for which we have agreements to purchase power from the facilities, and represents an indirect GHG emissions source for TransCanada. These arrangements are excluded from our reporting boundary and were terminated in 2016. Values reported in previous TransCanada reports may differ from the above as inputs may be updated after the date of publication of annual reports such as the CSR, and we regularly review reporting scopes and methodologies.

Photo at right: TransCanada's commitment to protecting the environment guides our daily decisions as we design, build and operate energy infrastructure.

ENVIRONMENTAL RESPONSIBILITY

TransCanada scored in the 100th percentile on the Dow Jones Sustainability Index (DJSI), and earned rankings on the DJSI North America and World Indices in 2015.

CRUDE OIL SPILLS

TransCanada takes extensive preventive measures to ensure that our pipelines operate safely. In the unlikely event of a crude oil spill, TransCanada has extremely comprehensive and prescriptive emergency response plans in place to quickly and effectively minimize risk to people and the environment.

Since beginning operations in July 2010, Keystone has delivered more than 1.2 billion barrels of oil from Canada to the U.S. The spills that occurred on Keystone during the reporting period (up to December 31, 2015) indicated below have been at pump stations and other above-ground facilities and have been related to leakage from small-diameter fittings and seals. All causative issues have been repaired or addressed. All crude oil spills were cleaned up with no adverse impact to the environment. TransCanada investigates and learns from all crude oil spills to make system-wide improvements in order to prevent similar occurrences.

REPORTABLE CRUDE OIL SPILLS

	2011	2012	2013	2014	2015
Canada					
Number	42	44	21	9	1
Total Volume (litres)	438	214	3,054	61	2,300
U.S.					
Number	8	0	1	1	0
Total Volume (litres)	65,753	0	76	238	0

A reportable spill is defined as one that is reportable to a regulatory body, such as a federal or provincial or state regulator. Prior to July 1, 2014 in Canada, all Keystone crude oil spills, regardless of volume, were reportable to the Canadian Transportation Safety Board (TSB). The higher number of reportable spills prior to 2014 reflects this previous requirement. Data reported in previous TransCanada CSR reports may differ from the above as data have been updated to reflect finalized incident information.

ENVIRONMENTAL FINES ($s)

	2013	2014	2015
Energy Operations	7,500 US	1,000 US	0
Gas and Gas Storage Operations	1,000 US	0	15,500 US
Oil Operations	0	0	0
Project Development	2,690 CAD	0	5,000 CAD

REGULATORY PERFORMANCE

Regulatory compliance is integral to TransCanada's Environmental Management Program and is the primary guiding principle of our Health, Safety and Environment Commitment Statement.

TransCanada received four regulatory Notices of Violation in 2015 which were resolved by small monetary penalties. The resulting fines totalled US$15,500 and CAD$5,000 and were as follows: a Louisiana Department of Public Safety fine of US$3,500 for the delayed reporting of a minor spill resulting from a mainline valve leak; a Spokane Regional Clear Air Agency fine of US$8,000 for an air permit limit exceedance during a planned emissions test at one of our compressor stations; a Washington Department of Ecology fine of US$4,000 for an air permit limit exceedance during a planned emissions test at one of our compressor stations; and a Québec Ministry of Sustainable Development, Environment and the Fight Against Climate Change (the Ministry) fine of CAD$5,000 for carrying out project-related geophysical surveys in the St. Lawrence River without first obtaining a Certificate of Authorization from the Ministry. All causative factors have been identified and any appropriate corrective action has been performed.

WATER CONSUMPTION

TOTAL WATER CONSUMPTION [1]

(million cubic metres)

	2014	2015
Total	3.8	4.2

1 Total Water Consumption: water withdrawn, net of water discharged to the source with higher or equal quality.

Note: The above data includes our power assets and Canadian pipeline assets.

Photo at right: ANR Pipeline's Blue Lake compressor station in Michigan is part of TransCanada's extensive network of natural gas pipelines, which supplies 20 per cent of the natural gas consumed daily across North America.