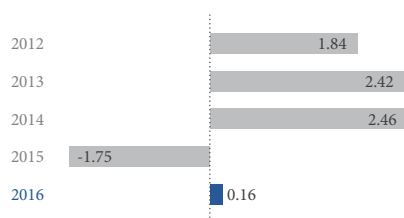


A Transformational Year

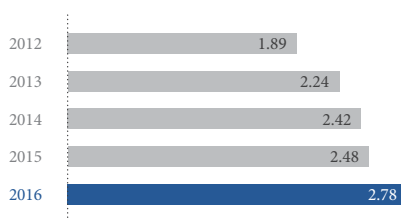
2016
LETTER TO
SHAREHOLDERS

FINANCIAL HIGHLIGHTS

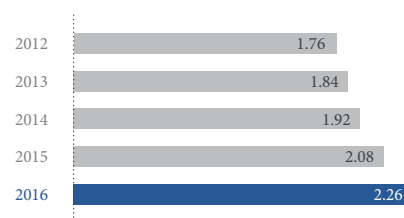
Net Income/(Loss) per Common Share (dollars)



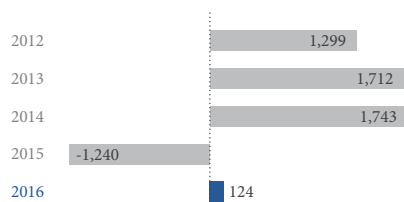
Comparable Earnings per Common Share¹ (dollars)



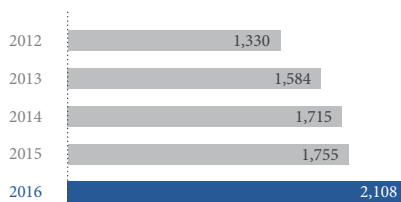
Dividends Declared per Common Share (dollars)



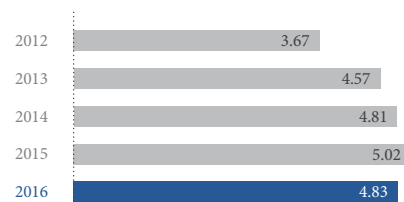
Net Income/(Loss) Attributable to Common Shares (millions of dollars)



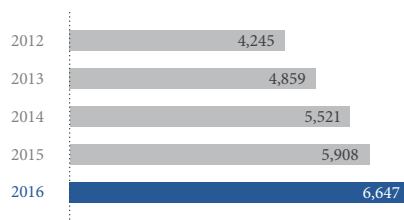
Comparable Earnings¹ (millions of dollars)



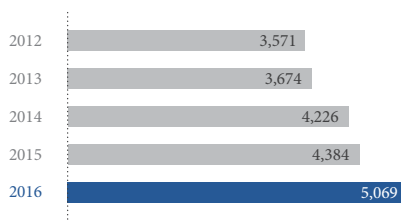
Comparable Distributable Cash Flow per Common Share¹ (dollars)



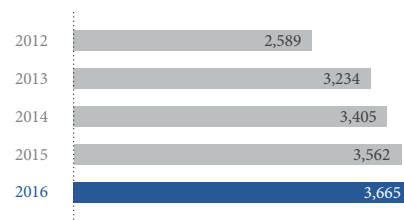
Comparable EBITDA¹ (millions of dollars)



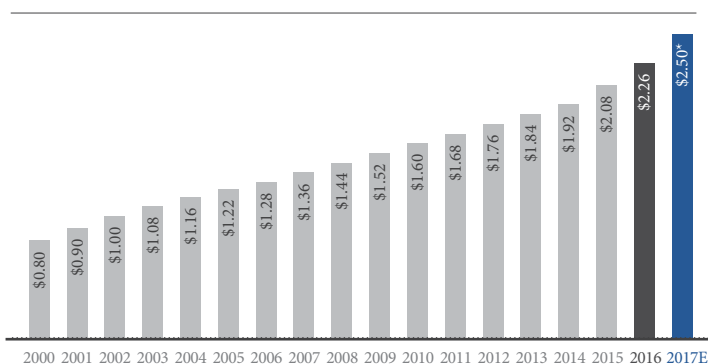
Net Cash Provided by Operations (millions of dollars)



Comparable Distributable Cash Flow¹ (millions of dollars)

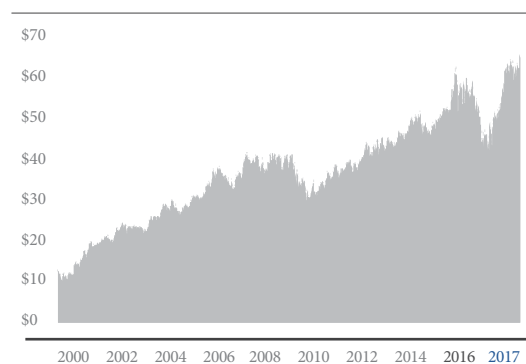


Track Record of Dividend Growth



* Annualized based on first quarter declaration

Common Share Price – Toronto Stock Exchange



TransCanada's shareholders have benefited from a 14% annual total return since 2000.

(1) Non-GAAP measures which do not have any standardized meanings prescribed by U.S. generally accepted accounting principles (GAAP). For more information, see non-GAAP measures in the Management Discussion and Analysis of the 2016 Annual Report.

Forward-Looking Information and Non-GAAP Measures

These pages contain certain forward-looking information and also contain references to certain non-GAAP measures that do not have any standardized meaning as prescribed by U.S. generally accepted accounting principles (GAAP) and therefore may not be comparable to similar measures presented by other entities. For more information on forward-looking information, the assumptions made, and the risks and uncertainties which could cause actual results to differ from the anticipated results, and reconciliations of non-GAAP measures to the most closely related GAAP measures, refer to TransCanada's 2016 Annual Report filed with Canadian securities regulators and the U.S. Securities and Exchange Commission and available at TransCanada.com.

ABOUT TRANSCANADA

For over 65 years, TransCanada has proudly delivered the energy that millions of North Americans rely on to heat and cool their homes, fuel transportation and power industry. Our facilities operate safely, reliably and with minimal impact on the environment, while our over 7,100 employees play an active part in the communities where they live in Canada, the United States and Mexico.

OUR VISION

To be the leading energy infrastructure company in North America, focusing on pipeline and power generation opportunities where we have, or can develop, a significant competitive advantage.

THREE COMPLEMENTARY ENERGY INFRASTRUCTURE BUSINESSES



Natural Gas Pipelines

Our 91,500-kilometre (56,900-mile) network of natural gas pipelines supplies more than 25 per cent of the clean-burning natural gas consumed daily across North America. This pipeline network strategically connects growing supply to key markets across our three operating geographies of Canada, the U.S. and Mexico. We are also the continent's largest provider of natural gas storage, with 653 billion cubic feet (Bcf) of regulated and unregulated storage capacity. Please visit the Natural Gas Pipelines Business section of the Management's Discussion and Analysis (MD&A) to learn more.



Liquids Pipelines

Our 4,300-kilometre (2,700-mile) Keystone Pipeline System transports 545,000 barrels of crude oil per day (bbl/d), or approximately 20 per cent of western Canadian exports to key refinery markets in the U.S. Midwest and Gulf Coast where it is converted into fuel and other useful petroleum products. Keystone has safely delivered more than 1.4 billion barrels since it began operation in June 2010. Please visit the Liquids Pipelines section of the MD&A to learn more.



Energy

TransCanada owns or has interests in 17 power generation facilities with capacity of 10,700 megawatts – enough to power more than 10 million homes. One-third of the power we provide is generated from emission-less sources including nuclear, hydro, wind and solar and we are leaders in the development and operation of high efficiency, natural gas-fired power facilities. Please visit the Energy section of the MD&A to learn more.

STRONG PERFORMANCE, ATTRACTIVE OPPORTUNITIES

- *Track record of delivering long-term shareholder value – 14 per cent average annual shareholder return since 2000.*
- *Visible growth portfolio – \$23 billion in commercially secured near-term growth projects underway for completion by 2020. Advancing over \$48 billion in medium to longer term projects.*
- *Attractive, growing dividend – Expect to grow our common share dividend at an average annual rate at the upper end of eight to ten per cent through 2020.*
- *Strong financial position – 'A' grade credit rating and predictable, low-risk businesses underpinned by long-term contracts or regulated cost-of-service models are expected to produce solid results in various market conditions.*
- *Committed to responsible development – We have an industry-leading safety record and have been recognized by numerous third-party rating agencies for excellence in balancing safety, profitability and social and environmental responsibility.*

A TRANSFORMATIONAL YEAR

DEAR FELLOW SHAREHOLDERS,

Last year was truly transformational for our company, as our portfolio of high-quality energy infrastructure assets performed very well at the same time as our long-term strategy and financial discipline allowed us to undertake unprecedented growth and achieve greater control over our destiny in ways that will reward our shareholders in the years ahead.

We are pleased to report that TransCanada has navigated the turbulent waters facing the energy industry over the last several years very well and has emerged a larger, stronger and more competitive enterprise as a result.

Strategy in Action – Columbia Acquisition

Our most significant initiative in 2016 unfolded near the end of the first quarter when we announced the acquisition of Columbia Pipeline Group for US\$13 billion. This was the largest business transaction TransCanada has undertaken since our merger with Nova in 1998. It was a rare opportunity to diversify our regulated natural gas pipeline and storage operations and gave us an incumbency position in the Appalachian basin, one of the world's fastest growing and lowest cost natural gas production regions. The acquisition closed on July 1, adding 24,500 km (15,200 miles) of interstate natural gas pipelines between New York and the Gulf of Mexico to our already expansive network that now includes a broad footprint in the Marcellus and Utica shale gas plays. With the addition of Columbia's assets, TransCanada now transports 23 billion cubic feet per day (Bcf/d), or more than 25 per cent of North America's daily natural gas demand, and we are now the continent's largest natural gas storage provider.

The successful acquisition of Columbia was only possible due to our strategy of maintaining our financial strength and flexibility, including our 'A' grade credit rating that positions us to access capital on compelling terms at all points in the economic cycle. Financing the deal involved issuing \$7.9 billion in equity through two bought deal share offerings and the decision to permanently divest our merchant power generation assets in the Northeastern United States. The addition of Columbia's regulated natural gas business has brought greater stability and predictability to our revenue streams. Looking forward, more than 95 per cent of our earnings before interest, taxes, depreciation and amortization (EBITDA) are expected to be generated by regulated or long-term contracted assets. Columbia also added meaningful near-term growth to our portfolio, bringing the total to \$23 billion in projects that are expected to drive significant growth in earnings and



*Russ Girling, President and Chief Executive Officer
S. Barry Jackson, Chair of the Board*

cash flow and underpin our ability to deliver an annual average dividend growth at the upper end of an eight to 10 per cent range through the rest of the decade.

Record Results in 2016

In 2016 we continued our unwavering focus of providing safe and reliable operations everywhere we do business. We are proud to have occupational and facility safety records that are among the best in the industry, and our pipeline and power facilities operated throughout 2016 without any major incidents, but we believe that no safety-related incidents are acceptable. While we continue to strive for top quartile performance and achieved a 50 per cent improvement in staff and contractor days away from work cases, we did not achieve the tough standards we set for ourselves. Last March, we experienced the tragic fatality of a contractor on one of our worksites. This is unacceptable and we have increased our already significant efforts to work with our contractors to ensure the safety of their workers on our sites. We have also reinforced our commitment to our goal of zero incidents by adopting safety as the first of our four corporate values. Moving forward, Safety, Integrity, Responsibility and Collaboration will be the guiding principles for everything we do.

TransCanada's share price reached all-time highs, reflecting our strategic repositioning, unparalleled growth prospects and strong operational performance.

The addition of Columbia along with the completion of several other growth projects has resulted in our asset base growing to \$88 billion. [TransCanada's share price reached all-time highs, reflecting our strategic repositioning, unparalleled growth prospects and strong operational performance.](#) Comparable earnings per share increased by 12 per cent compared to 2015, while net cash provided by operations exceeded \$5 billion for the first time in the company's history. Based on this sustainable growth, in February 2017 our Board of Directors approved our 17th consecutive annual increase in the common share dividend, increasing the annualized dividend from \$2.26 to \$2.50, an increase of 10.6 per cent.

Business Units Performing Well

Since July, we have made significant progress integrating Columbia's operations with our existing business and are well on track to realize the targeted US\$250 million of annualized benefits by 2018. Also in our U.S. pipeline business, we reached a settlement with our customers that will result in higher rates on the ANR Pipeline and a three-year program to undertake long-term upgrades on the system. We realized higher contributions from our natural gas pipelines in Mexico in 2016, as we began collecting revenues on the Topolobampo and Mazatlan pipelines. Once the remaining three projects we have underway in the country enter service in 2018, [we expect our Mexican assets to generate approximately US\\$575 million of annual EBITDA, more than triple the level of 2015.](#) Similarly, the NGTL System in Alberta continues its steady growth with new facilities being added to meet demand and new contracts. NGTL now gathers most of the gas production in the Western Canada Sedimentary Basin and transported approximately 11.3 Bcf/day in 2016, up from 11 Bcf/d in 2015.

[Our Liquids Pipelines business continues to perform well, with the Keystone Pipeline System generating in excess of \\$1 billion of EBITDA per year based on take-or-pay contracts to ship 545,000 bbl/d with an average remaining contract life of 15 years.](#) Keystone extended its reach into the U.S. Gulf Coast refining centre with the completion of the Houston Lateral pipeline and tank terminal project

in August, enhancing Keystone's short- and long-haul capabilities. With this addition, the Keystone system now provides access to approximately 6 million bbl/d of U.S. refining markets.

In our Energy business, our increased stake in the Bruce Power nuclear facility yielded higher earnings, while we took steps to dramatically reduce our exposure to the merchant power market through the planned sale of our power assets in the Northeastern U.S. and the termination of our power purchase agreements in Alberta. Our remaining power generation assets are underpinned primarily by long-term contracts with solid counterparties. We have also committed to significant long-term investments to extend the life of Bruce Power to the end of 2064, as this important facility provides approximately 30 per cent of Ontario's power supply and is an integral part of the province's Long Term Energy Plan. [TransCanada is well positioned to capture new opportunities in North America's electricity market with the transition away from coal-fired power in favour of renewable and gas-fired generation.](#)

Predictable, Low-Risk Growth

Looking forward, the stability of our base business is complemented by our portfolio of \$23 billion in near-term growth projects scheduled for completion by the end of the decade. All of these projects are underpinned by long-term contracts or regulated business models and span our three business lines. More than \$18 billion of these projects are natural gas pipelines and related facilities, including approximately US\$7.1 billion in projects associated with Columbia, \$5.4 billion in NGTL System expansions and three projects totaling US\$2.5 billion of new investment underway in Mexico. Liquids pipelines projects totaling \$2.1 billion are under construction to serve the needs of oil sands producers in moving their products within Alberta. Another \$2.2 billion of investment is taking place in the Ontario power sector, where the Napanee Generating Station is on track to begin service in 2018, while asset management work is underway at Bruce Power in the first phase of its long-term life extension program.

Moving forward, Safety, Integrity, Responsibility and Collaboration will be the guiding principles for everything we do.

We continue to advance over \$48 billion in medium to longer term projects that provide significant options for growth for our shareholders. This portfolio is underpinned by two major crude oil and two natural gas pipeline projects, any one of which would generate significant incremental annual EBITDA upon their successful completion.

The Energy East and the Keystone XL crude oil pipeline projects could together provide 2 million bbl/d of long-haul capacity to move growing Canadian oil production to domestic and international markets. Meanwhile, in British Columbia our Prince Rupert Gas Transmission and Coastal GasLink projects could see us invest approximately \$10 billion in bringing that province's emerging liquefied natural gas (LNG) industry to life. Combined, these pipelines would be capable of moving more than 4 Bcf/d of Canadian natural gas to international markets.

Positioned for Long-Term Success

It is clear that the strategy we put in place in 2000 continues to pay off and has proven resilient through a myriad of business conditions and economic cycles. We have built a solid foundation of complementary energy infrastructure assets that are critical for meeting North America's needs. Our growth plan is comprised of tangible, commercially secured projects in each of our business lines and geographies that align with long-term energy supply and demand. *Our shareholders have been rewarded with growing dividends and an average annual total shareholder return of 14 per cent over that period.*

How we conduct our business is important to our stakeholders across North America and we know that the continued success of our company depends on our ability to operate in an economically, socially and environmentally sustainable manner. We continue to consider every business decision in terms of our performance in these areas and *we continue to receive recognition from highly regarded third-party agencies for our achievements.* For the 15th year in a row, we were named to the Dow Jones Sustainability Index (DJSI) World Index and earned a place on DJSI's North American Index in 2016. We also improved our position in Newsweek's World Green Rankings and on Corporate Knights magazine's list of the Best 50 Corporate Citizens in Canada.

In 2016 we continued with our orderly succession of our Board of Directors, with the appointment of Siim A. Vanaselja as the next chair, subject to his re-election by shareholders at the 2017 annual meeting. Mr. Vanaselja has been a member of TransCanada's board since 2014 and has served as the chair of TransCanada's audit committee. We both look forward to working with him in the months ahead. We also look forward to working with Stéphan Crétier, who joins the board on February 17, 2017. Mr. Crétier's extensive experience as CEO of a multinational corporation, along with his leadership skills, strategic insight, and business acumen will be a valuable addition to our board. We would also like to extend our sincere thanks to John Richels, who will be retiring from the board on May 5, 2017. Mr. Richels served as a director for four years, during which time his industry knowledge and management experience provided context and perspective to the human resources committee and the health, safety and environment committee.

To conclude, 2016 was a remarkable year for TransCanada, but it also involved a lot of change and uncertainty for many of our employees, as we made significant organizational changes to accommodate our growth and to become more effective and efficient in how we conduct our business. *By embracing change and adjusting the focus of our growth program, we are a stronger, more competitive company with an enhanced degree of confidence in our plans.* The future remains bright for TransCanada and we would like to thank all of our employees and shareholders for their continued commitment to our long-term success.

Sincerely,



Russ Girling
*President and
Chief Executive Officer*



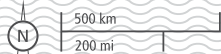
S. Barry Jackson
Chair of the Board

TransCanada today

February 2017

- Natural Gas Pipeline
- In Development/Construction
- Liquids Pipeline
- In Development/Construction
- Regulated Natural Gas Storage
- Liquids Tank Terminal
- Office Location

- Natural Gas Power Generation
- Wind Power Generation
- Solar Power Generation
- Hydro Power Generation
- Nuclear Power Generation
- Unregulated Natural Gas Storage



Shareholder Information

TransCanada welcomes questions from shareholders and investors.
Please contact:

David Moneta, Vice President, Investor Relations

telephone: **403.920.7911**

toll free: **1.800.361.6522**

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Listing Information

Common Shares (TSX, NYSE): TRP

Preferred Shares (TSX):

Series 1: TRP.PR.A

Series 2: TRP.PR.F

Series 3: TRP.PR.B

Series 4: TRP.PR.H

Series 5: TRP.PR.C

Series 6: TRP.PR.I

Series 7: TRP.PR.D

Series 9: TRP.PR.E

Series 11: TRP.PR.G

Series 13: TRP.PR.J

Series 15: TRP.PR.K

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toll free: **1.800.340.5024**

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Corporate Social Responsibility Report

Building a successful future means doing the right thing today.

View our CSR report: **www.csrreport.transcanada.com**

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