

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

With over 65 years of experience, TransCanada is a leader in the responsible development and reliable operation of North American energy infrastructure including natural gas and liquids pipelines, power generation and natural gas storage facilities.

We operate in three core businesses – Natural Gas Pipelines, Liquids Pipelines and Energy. In order to provide information that is aligned with how management decisions about our business are made and how performance of our business is assessed, our results are reflected in five operating segments: Canadian Natural Gas Pipelines, U.S. Natural Gas Pipelines, Mexico Natural Gas Pipelines, Liquids Pipelines and Energy. We also have a non-operational Corporate segment consisting of corporate and administrative functions that provide governance and other support to our operational business segments.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1 2017	December 31 2017	No	<Not Applicable>
Row 2	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 3	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 4	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

C0.3

(C0.3) Select the countries/regions for which you will be supplying data.

Canada
 Mexico
 United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

CAD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Equity share

C-EU0.7

(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.

Row 1

Electric utilities value chain

Electricity generation

Other divisions

Gas storage, transmission and distribution

C-OG0.7

(C-OG0.7) Which part of the oil and gas value chain and other areas does your organization operate in?

Row 1

Oil and gas value chain

Downstream

Other divisions

Please select

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board/Executive board	The President/CEO is a member of TransCanada's Board of Directors and is responsible for our overall leadership and vision in developing with our Board our strategic direction, values and business plans. The Terms of Reference for the President/CEO stipulate that he or she manage the business to create sustainable long shareholder value and identify and communicate all material risks along with mitigation plans and procedures. Duties and responsibilities include keeping the Board fully informed on all matters of significant relevance to the Company including environmental policies and legislation affecting operations (eg. those relating to climate change) and ensuring the reporting of related risks to the Board on a regular and timely basis. The Terms of Reference also specify that the President/CEO create a tone at the top and pervasive culture to ensure, among other things, compliance with environmental policies and practices in addition to encouragement of social responsibility.
Chief Executive Officer (CEO)	The President/CEO is a member of TransCanada's Board of Directors and is responsible for our overall leadership and vision in developing with our Board our strategic direction, values and business plans. The Terms of Reference for the President/CEO stipulate that he or she manage the business to create sustainable long shareholder value and identify and communicate all material risks along with mitigation plans and procedures. Duties and responsibilities include keeping the Board fully informed on all matters of significant relevance to the Company including environmental policies and legislation affecting operations (eg. those relating to climate change) and ensuring the reporting of related risks to the Board on a regular and timely basis. The Terms of Reference also specify that the President/CEO create a tone at the top and pervasive culture to ensure, among other things, compliance with environmental policies and practices in addition to encouragement of social responsibility.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding risk management policies	The TransCanada Board of Directors primary responsibilities are to foster TransCanada's long-term success, oversee our business and affairs and management, and to act honestly, in good faith and in the best interests of TransCanada. The Charter of the Board of Directors specifically provides that the Board has responsibility to receive, on a regular basis, reports from management on matters relating to, among other things "environmental management". Climate-related risks are an important consideration in our strategic priorities and this topic has been included in strategic planning sessions with the Board. In addition, at every scheduled meeting, the Board is provided a brief on "top of mind" business risks which has included the financial, reputational and shareholder impacts of environmental, social and governance issues, and more specifically, risks associated with climate change. Risks associated with climate change are categorized as a key business risks. Although climate change risks are inter-related and managed at various levels, the Health, Safety and Environment (HSE) committee of TransCanada's Board of Directors (the Board) oversees operational risk, people and process safety, security of personnel and environmental risks, and monitors compliance with our HSE corporate programs through regular reporting from management. We use an integrated management system that establishes a framework for managing these risks and which is used to capture, organize, document, monitor and improve our related policies, programs and procedures. It follows a continuous improvement cycle organized into four key areas: planning, implementing, reporting and action. Through implementing our Environment Program, we continually monitor our facilities to ensure compliance with all environmental requirements. We routinely monitor proposed changes in environmental (including climate change-related) policy, legislation and regulation, and where the risks are potentially large or uncertain, we comment on proposals independently or through industry associations. Early identification of issues allows the Company to develop strategies for understanding and mitigating impacts.

C1.2

(C1.2) Below board-level, provide the highest-level management position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other, please specify (Executive Leadership Team)	Both assessing and managing climate-related risks and opportunities	As important matters arise
Other, please specify (Internal HSE Committee)	Managing climate-related risks and opportunities	Quarterly
Other, please specify (See comment) VP, Environment, Land and Indigenous Relations	Assessing climate-related risks and opportunities	Quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored.

Our President and CEO holds the highest level of responsibility for addressing climate-related issues and accountability and responsibility cascades throughout the organization. Our Executive Leadership Team is accountable for developing and implementing risk management plans and actions. This includes monitoring, assessing and communicating the climate change policy and regulatory context over the near, medium and long term.

Our main sources of environmental risks include but are not limited to changing regulations and costs associated with our emissions of air pollutants and GHG and conformance and compliance with corporate and regulatory policies and requirements and new regulations.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.

Who is entitled to benefit from these incentives?

Corporate executive team

Types of incentives

Monetary reward

Activity incentivized

Other, please specify (Risk Reduction)

Comment

All members of the executive leadership team were responsible for the corporate key performance areas (KPA). One KPA was maximizing value of existing asset base. Indicators for this KPA include but are not limited to risk reduction. Our executive leadership team is accountable for developing and implementing risk management plans and actions, and effective risk management is reflected in their compensation. Our main environmental risks include but are not limited to changing regulations and costs associated with our emissions of air pollutants and GHGs and conformance and compliance with corporate and regulatory policies and requirements and new regulations. Compliance includes certain assets covered by GHG emission programs such as carbon pricing with emissions reduction targets.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	1	TransCanada will report on how the company is assessing long-term risks and opportunities in relation to climate change and the current transition to a low-carbon economy. Such reporting should provide an analysis of the resilience of TransCanada's business model in various scenarios and could include a 2°C scenario analysis. This reporting should be done at reasonable cost, omit proprietary information and be issued before the company's annual meeting in 2019.
Medium-term	2	6	TransCanada understands that shareholders and other stakeholders want more information on how the company is addressing climate change and associated risks. As the tools available to assess the risks and opportunities associated with climate change improve, we are utilizing them in order to increase the rigor of our assessment, as a key input into our strategic planning process. We regularly communicate with the investor community to solicit feedback and are committed to continually improving our disclosure to meet the needs and expectations of shareholder and stakeholders.
Long-term	7	22	TransCanada operates under a low-risk and enduring business model that maximizes the full-life value of our long-life assets and commercial positions through all points in the business cycle. World demand for energy has grown and is expected to continue to grow, and clean, affordable and reliable energy will be critical to improving and maintaining standards of living, economic growth and national and international security. While renewables are the fastest growing form of new power generation, respected authorities such as the International Energy Agency forecast that oil and natural gas will continue to be dominant energy sources and a vital part of the energy mix for decades to come. Our investment in balanced and sustainable energy systems, our current asset portfolio and our future growth plans all reflect the long-term supply and demand forecasts for all forms of energy.

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	TransCanada has an internal, multi-disciplinary team that continuously refines the Company's strategy for managing climate change risks and opportunities. This group is responsible for monitoring, assessing and communicating the climate change policy and regulatory context over the near, medium and long-term. Key business risks which has included Climate change risks are provided to TransCanada's BOD at regular BOD meetings and the Governance Committee, which oversees the Company's approach to risk.

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

Company level risk and opportunity identification processes:

TransCanada has a multi-year strategic plan that balances risk and reward.

The Board provides oversight and direction on our strategic planning process to ensure management develops corporate strategies that support our vision to be the leading energy infrastructure company in North America. To achieve this, we have a five-year strategic plan which we update and extend annually and hold strategic issues sessions with the Board throughout the year to consider specific and emerging issues. As part of this, management includes an assessment of energy fundamentals, the competitive environment, and risks to identify opportunities and threats to our business and strategy. Climate change considerations were included in the 2017 assessment and subsequent discussions. The Governance committee oversees the process used to prepare and articulate the strategy as well as overseeing the Company's approach to risk management.

The Board and its committee are responsible for risk oversight including overseeing management systems and processes for identifying, evaluating, prioritizing and mitigating risks. A key business risk is generally defined as exposure that has the potential to materially impact TransCanada's ability to meet or support its business, operational or strategic objectives.

TransCanada maintains a comprehensive Corporate Risk Register which identified principal risks associated with our business and seeks input across the organization to ensure it reflects any new key business risks as our business grows and environment evolves. Climate change considerations are included in the Corporate Risk Register. All risks identified under the Risk Register are categorized using a risk responsibility matrix which establishes clear accountabilities to the Board, committees and executive responsible for specific oversight of each risk.

The Governance committee oversees the risk management process. The committee reviews 'top-of-mind' risks with management and at each committee meeting and with the entire Board of Directors at each scheduled meeting. Developments related to climate change were identified as 'top-of-mind' throughout 2017. Our process ensures that the Board is fully informed of the interrelationships between the business environment and risks, and is intended to facilitate and stimulate discussion of our key business risks while ensuring appropriate mitigation.

C2.2c

(C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	We own assets and have business interests in a number of regions subject to GHG emissions regulatory requirements, including GHG emissions management and carbon pricing policies.
Emerging regulation	Relevant, always included	Across North America, there are a variety of new and evolving initiatives in development at the federal, regional, state and provincial level aimed at reducing GHG emissions. We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We expect that, over time, most of our assets will be subject to some form of regulation to manage GHG emissions. Changes in regulations may result in higher operating costs or other expenses, or higher capital expenditures to comply with possible new regulations.
Technology	Relevant, always included	Technological advancements will continue to be important to address climate change and serve as a key consideration in determining emissions reduction timelines to ensure continued economic growth and avoid creating economic or competitive imbalances.
Legal	Relevant, always included	We comply with all applicable laws concerning GHG emissions, including policy mechanisms such as carbon pricing, that are becoming more commonplace where TransCanada operates.

	Relevance & inclusion	Please explain
Market	Relevant, always included	TransCanada has proudly delivered the energy that millions of North Americans rely on to power their lives and fuel industry for over 65 years. Our vision is to be the leading energy infrastructure company in North America, focusing on pipeline and power generation opportunities in regions where we have or can develop a significant competitive advantage. Our opportunities for long-term success and continued performance are driven by our high-quality portfolio, predictable and low-risk businesses, track record of delivering long-term shareholder value and demonstrated commitment to safety and responsible development. To achieve our vision, we prepare and adapt to the opportunities and challenges that arise operating in an undeniably complex and evolving energy environment. Challenges include the growing global demand for energy, emerging and revised climate change policies that are accelerating the desire to transition to lower-carbon energy sources, and fluctuating commodity prices. Inadequately managing expectations and issues important to stakeholders, including those related to climate change, could affect our reputation and our ability to operate and grow, and continued access to sources of capital.
Reputation	Relevant, always included	Our operations and growth prospects require us to have strong relationships with key stakeholders including Indigenous communities, landowners, government and government agencies and environmental non-governmental organizations. Inadequately managing expectations and issues important to stakeholder, including those related to climate change, could affect our reputation and our ability to operate and grow, and continue to access sources of capital. Our reputation with stakeholders, including Indigenous communities, can have a significant impact on our operations and projects, infrastructure development and overall reputation. Should investors develop negative perceptions regarding energy infrastructure business, future access to investment capital could be negatively impacted. Our Stakeholder Engagement Framework guides our engagement activities with stakeholders. Our four core values – safety, integrity, responsibility and collaboration – are at the heart of our commitment to stakeholder engagement, and guide us in our interactions with stakeholders. We also have specific stakeholder programs and policies that set requirements, assess risks and ensure compliance with legal and policy requirements.
Acute physical	Relevant, always included	Significant changes in temperature and other weather events have many effects on our business , ranging from the impact on demand, availability and commodity prices, to efficiency and output capability. Extreme temperature and weather can affect market demand for power and natural gas and can lead to significant price volatility. Extreme weather can also restrict the availability of natural gas and power if demand is higher than supply. Seasonal changes in temperature can reduce the efficiency of our natural gas-fired power plants, and the amount of power they produce. Variable wind speeds affect earnings from our wind assets. Operational risks, including labor disputes, equipment malfunctions or breakdowns, acts of terror and sabotage, or natural disasters and other catastrophic events, including those related to climate change. Decrease in revenue, increase in operating costs or legal proceedings or other expenses all of which could reduce our earnings. Losses not covered by insurance could have an adverse effect on operations, cash flow and financial position. We have incident, emergency and crisis management systems to ensure an effective response to minimize further loss or injuries and to enhance our ability to resume operations. We also have a Business Continuity Program that determines critical business processes and develops resumption plans to ensure process continuity. We have comprehensive insurance to mitigate some of these risks, but insurance does not cover all events in all circumstances.
Chronic physical	Relevant, always included	Significant changes in temperature and other weather events have many effects on our business , ranging from the impact on demand, availability and commodity prices, to efficiency and output capability. Extreme temperature and weather can affect market demand for power and natural gas and can lead to significant price volatility. Extreme weather can also restrict the availability of natural gas and power if demand is higher than supply. Seasonal changes in temperature can reduce the efficiency of our natural gas-fired power plants, and the amount of power they produce. Variable wind speeds affect earnings from our wind assets. Operational risks, including labor disputes, equipment malfunctions or breakdowns, acts of terror and sabotage, or natural disasters and other catastrophic events, including those related to climate change. Decrease in revenue, increase in operating costs or legal proceedings or other expenses all of which could reduce our earnings. Losses not covered by insurance could have an adverse effect on operations, cash flow and financial position. We have incident, emergency and crisis management systems to ensure an effective response to minimize further loss or injuries and to enhance our ability to resume operations. We also have a Business Continuity Program that determines critical business processes and develops resumption plans to ensure process continuity. We have comprehensive insurance to mitigate some of these risks, but insurance does not cover all events in all circumstances.
Upstream	Relevant, always included	Demand for pipeline capacity is ultimately the key driver that enables pipeline transportation services to be sold and is impacted by supply and market competition, variations in economic activity weather variability, natural gas pipeline and storage competition and pricing of alternative fuels. Renewal of expiring contracts and the opportunity to charge and collect a toll that the market accepts depends on the overall demand for transportation service. A decrease in the level of demand for our pipeline transportation services could adversely impact revenues.
Downstream	Relevant, always included	Public opinion about crude oil development and production can have an impact on the regulatory processes with which we are required to comply, and this may be influenced by some individual and interest groups lobbying against the construction of liquids pipelines. A decrease in demand for refined crude oil products could adversely impact the price that crude oil producers receive for their product. Lower crude oil prices could mean producers may curtail their investment in the further development of crude oil supplies. Depending on the severity, these factors would negatively impact opportunities to expand our liquids pipeline infrastructure and, in the longer term, to re-contract with shippers as current agreements expire.

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Company level: See C2.2b.

Asset level: TransCanada monitors and actively participates in climate change issue and policy developments through several avenues including but not limited to government meetings, industry association groups, multi-stakeholder policy forums, publications, consultants' policy update reports who monitor regulatory developments. As these developments occur, an internal, multi-disciplinary team assesses the implications for the Company's assets. Certain operating segments have established personnel that are responsible for the risk management associated with GHG emissions for associated assets.

Assessment Process: Risks are identified, categorized (strategic, financial, operational, stakeholder, etc.), assessed and quantified to determine their priority level. Our internal carbon price may be included as a factor within the risk quantification. In addition, on a regular basis we assess risks and opportunities from new or proposed regulations by modelling potential future conditions, using corporate information such as known or forecast emissions, market influences (demand/supply), energy pricing structures, etc. In cases where the materiality criterion is met, the risks for existing assets are outlined and communicated to the HSE Committee of the Board of Directors. In addition, risks that are material to our Company, as the term "material" is defined under applicable securities law and guidance, are disclosed in our disclosure documents which are prepared and filed pursuant to applicable Canadian and U.S. Securities laws.

Operational Risk Management: Operational Risk Management processes are established under TransCanada's integrated management system and include risk identification, analysis, treatment and reporting steps. These processes are applied at an asset or business unit level through the implementation of TransCanada's Environment Program. Operational Risk Management processes inform Company level risk and opportunity identification.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact driver

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Across North America there are a variety of new and evolving initiatives in development at the federal, regional, state and provincial level aimed at achieving GHG emission reductions through direct or indirect means, including carbon pricing. We own assets and have business interests in a number of regions where there are regulations to address industrial GHG emissions, including GHG

pricing policies. TransCanada facilities are included in carbon pricing programs in California (cap and trade), the Northeast U.S. Regional Greenhouse Gas Initiative, British Columbia (carbon tax), Alberta (emissions trading scheme), Ontario (cap and trade) and Québec (cap and trade).

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Low

Potential financial impact

Explanation of financial impact

TransCanada cannot estimate the potential financial implications of proposed GHG policies on our future consolidated results of operations, financial position or cash flows. Such legislation or regulation could materially increase our operating costs, require material capital expenditures or create additional requirements for permitting, which could delay proposed projects. For reference, we incurred \$63 million of expense under existing carbon pricing programs in 2017.

Management method

Through implementing our Environment Program, we continually monitor our facilities to ensure compliance with all environmental requirements, including carbon pricing. We 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.

Cost of management

Comment

TransCanada has an internal, multi-disciplinary team that continuously refines the Company's strategy for managing climate change risks and opportunities. This group is responsible for monitoring, assessing and communicating the climate change policy and regulatory context over the near, medium and long-term. Internal management is provided by corporate and business segment personnel with multiple duties and management costs are nominal.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Other

Type of financial impact driver

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

In 2015, 195 nations including Canada, the U.S. and Mexico adopted the Paris Agreement, a global pact to fight climate change. The consensus agreement allows for continued momentum on climate change targets at the international level. Paris Agreement implementation is ongoing. No direct implications for TransCanada are expected resulting from adoption of the Paris Agreement. However, TransCanada is aware and continues to track how this process and outcome may affect national, state, and provincial governments pushing forward new climate-related requirements which would directly affect TransCanada. The existing and potentially amended GHG reduction commitments could materially increase our operating costs if these international commitments result in new or amended federal U.S., Canadian or Mexican regulatory programs for GHGs.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Low

Potential financial impact

Explanation of financial impact

Due to the speculative outlook regarding the details of future GHG restrictions and compliance mechanisms, we cannot estimate the potential effect of new or proposed GHG policies on our operations, financial condition or consolidated results of operations. In addition, the instruments to implement GHG emissions from international accords vary, making it difficult to assess their implications. It is reasonably likely that such legislation or regulations could materially increase our operating costs, e.g. our cost of compliance by requiring us to install additional equipment and potentially purchase emission allowances/offset credits.

Management method

Through implementing our Environment Program, we continually monitor our facilities to ensure compliance with all environmental requirements, including carbon pricing. We 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.

Cost of management

Comment

TransCanada has an internal, multi-disciplinary team that continuously refines the Company's strategy for managing climate change risks and opportunities. This group is responsible for monitoring, assessing and communicating the climate change policy and regulatory context over the near, medium and long-term. Internal management is provided by corporate and business segment personnel with multiple duties and management costs are nominal.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Changes in precipitation patterns and extreme variability in weather patterns

Type of financial impact driver

Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

Company- specific description

Significant changes in temperature and other weather events have many effects on our business. Ranging from the impact on demand, availability and commodity prices, to efficiency and output capability. Extreme temperature and weather can affect market demand for power and natural gas and can lead to significant price volatility. Extreme weather can also restrict the availability of natural gas and power if demand is higher than supply. Seasonal changes in temperature can reduce the efficiency of our natural gas-fired power plants, and the amount of power they produce. Variable wind speeds affect earnings from our wind assets.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

Medium-low

Potential financial impact

Explanation of financial impact

Business interruptions, including operational risks from natural disasters (e.g. significant changes in temperature and extreme weather events) could have an impact through a decrease in revenues, increase in operating costs or legal proceedings or other expenses all of which could reduce our earnings. Losses not covered by insurance could have an adverse effect on operations, cash flow and financial position.

Management method

We have incident, emergency and crisis management systems to ensure an effective response to minimize further loss or injuries and to enhance our ability to resume operations. We also have a Business Continuity Program that determines critical business processes and develops resumption plans to ensure process continuity. We have comprehensive insurance to mitigate some of these risks, but insurance does not cover all events in all circumstances.

Cost of management

Comment

Costs of management are associated with asset specific teams that interpret, model and manage physical risks within the

commercial and engineering and operations of each business segment.

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Other

Type of financial impact driver

Reputation: Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions)

Company- specific description

Our reputation and relationship with Indigenous communities and our stakeholders including other communities, landowners, governments and government agencies, and environmental nongovernmental organizations is very important. Decisions by Canadian and U.S. regulators can have a significant impact on the approval, construction, operation and financial performance of our liquids pipelines. Public opinion about crude oil development and production may also have an adverse impact on the regulatory process. In conjunction with this, there are some individuals and interest groups that are expressing their opposition to crude oil production by lobbying against the construction of liquids pipelines.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Medium

Potential financial impact

Explanation of financial impact

Indigenous communities and stakeholders can have a significant impact on our operations, infrastructure development and overall reputation. Notwithstanding the current economic conditions, we remain committed to advancing our portfolio of commercially secured projects to connect growing Canadian and U.S. crude oil supply to key markets, maximizing the value from our current operating assets, leveraging existing infrastructure and expanding across our liquids pipelines business value chain in the near term.

Management method

Our Stakeholder Engagement Framework is our formal commitment to stakeholder engagement. Our four core values – safety, integrity, responsibility and collaboration – are at the heart of our commitment to stakeholder engagement, and guide us in our interactions with stakeholders. Additionally, our Indigenous Relations Program, including the Indigenous Relations Strategy, our Aboriginal Relations and Native American Relations Policies guide our engagement with Indigenous communities. We also have specific stakeholder programs that set requirements, assess risks and ensure compliance with legal and policy requirements.

Cost of management

Comment

TransCanada does not incur direct costs associated with managing reputational risk. The Company invests in monitoring of issues and increasing the robustness of its stakeholder relations program to ensure that social risks are mitigated effectively.

TransCanada devotes significant resources to monitoring and mitigating our reputation and relationships risks broadly as an organization and at the local level.

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Other

Type of financial impact driver

Other, please specify (Investment opportunities)

Company- specific description

The Government of Canada released the Pan-Canadian Framework on Clean Growth and Climate Change in 2016. According to the Framework, future actions will include but are not limited to expanding clean electricity systems, promoting inter-ties, ensuring a greater use of renewable energy, and reducing methane emissions from the oil and gas sector. The future Canadian electricity sector supply mix will feature significant levels of renewables and gas-fired capacity. We have expertise in building, operating and investing in a diverse set of generation technologies. 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.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-low

Potential financial impact

Explanation of financial impact

Efforts to transition to less carbon intensive forms of power generation are well aligned with our expertise in building and operating highly efficient natural gas-fired and renewable energy facilities.

Strategy to realize opportunity

Our past and present investments in natural gas, nuclear, wind, hydro and solar generating facilities demonstrates our commitment to clean, sustainable energy. TransCanada advocates for North American legislation/regulations that recognize the role that natural gas can play in mitigating GHG emissions. We also continue to pursue additional opportunities for new power generation assets in our established market areas. For example, investment opportunities remain in the Canadian power market and are expected to begin with new wind projects and later with the need for gas-fired power capacity required to replace retiring coal-fired plants.

Cost to realize opportunity

Comment

TransCanada's Energy business is a profit generating business. There is no net management cost.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Other

Type of financial impact driver

Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

Company- specific description

Opportunities arising from physical impacts of climate change may include increased natural gas demand for electricity generation to meet higher demand on air conditioning and heating loads in certain regions if temperatures become warmer or cooler than historical norms. However, any opportunities may be lessened by energy and climate change policies that are put in place. Other opportunities include the potential for increased demand for clean electricity generation such as wind, solar, hydro and nuclear. The use of periodic power such as wind and solar may also stimulate the need for more gas-fired generation as in-fill power for when the wind and solar generation is not operating. TransCanada anticipates an increased demand for natural gas due to changes in temperature extremes and further reliability during extreme weather events. TransCanada may also be impacted by a change in mean temperature, which may drive greater demand for electric generation needed for heating or cooling. This could result in greater demand for natural gas and power generation.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Low

Potential financial impact

Explanation of financial impact

We expect supply and demand for natural gas to continue to grow, and we are well positioned to continue to capture a significant portion of that growth.

Strategy to realize opportunity

TransCanada evaluates how trends in weather and temperature may affect energy demand for natural gas. TransCanada uses an internal, proprietary analysis of risks and opportunities associated with supply, demand, flows and pricing of natural gas. TransCanada is managing this opportunity by identifying and investing in growth opportunities.

Cost to realize opportunity

Comment

TransCanada's natural gas business segments are a profit generating business. There is no net management cost.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Type of financial impact driver

Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

Company- specific description

Consumer demand behaviour changes potentially may result in an increased awareness of energy sources and may create increased demand for renewable and low-carbon energy sources. Governments in North America are developing long-term plans for limiting GHG emissions. These plans, combined with a shift in consumer attitude and demand for low emissions fuels, will require changes in energy supply and infrastructure. The growth in demand for power in North America coupled with an aging electrical infrastructure base and a societal preference for lower carbon intensive electricity production is expected to provide us with the opportunity to participate in new generation and other power infrastructure projects, as well as connections to new and growing industrial, local distribution company, interconnect and electric power generation markets.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Low

Potential financial impact

Explanation of financial impact

TransCanada sees additional opportunity to develop new low- and non-emitting energy sources as consumer behaviour changes and market conditions shift to reflect these behaviours. We will continue to own, control and develop generation capacity.

Strategy to realize opportunity

Our past and present investments in natural gas, nuclear, hydro, wind and solar generating facilities demonstrates our commitment to clean, sustainable energy. TransCanada is an active member of the Pipeline Research Council international (PRCI), which is an industry association where member companies collaboratively pursue advancements in technology solutions to improve the design, construction and operation of pipeline facilities. Today PRCI is pursuing several research projects to reduce GHG and other emissions related to pipeline assets and equipment.

Cost to realize opportunity

Comment

TransCanada's Energy business is a profit generating business. There is no net management cost.

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	The power generation business remains a very important part of our portfolio and our long-term strategy. TransCanada owns or has interests in 11 power generation facilities with combined capacity of 6,100 MW —enough to power more than six million homes. More than one-half of the power we provide is generated from emission-less sources including nuclear and wind, and we are leaders in the development and operation of high-efficiency, natural gas-fired power facilities. Our divestiture of hydro and wind assets in the U.S. Northeast power market was a strategic decision as part of the financing for our acquisition of CPG. These were high quality facilities that served us well, but the fact that they operate in a merchant power market did not align with our focus on assets that are underpinned by long-term contracts or cost-of-service business models that provide stable and predictable revenue streams. Our decision to sell the Ontario Solar facilities in late-2017 was based on the opportunity to maximize the value of this asset as a power facility that was attractive to the market and represented less than two per cent of our generation capacity. The sale of the hydro, solar and some wind assets is not a reflection of the role that renewable energy plays in our strategy. We continue to pursue growth opportunities in the power business across North America that fit with our business strategy and risk preferences. We believe that billions of dollars of new investment will be required as we shift to electricity sources that have a lower GHG emissions intensity, including renewables, nuclear and natural gas-fired power generation.
Supply chain and/or value chain	Impacted	The energy industry is complex and multi-faceted, and is comprised of many different activities. TransCanada works as an intermediary in the oil and gas value chain, moving crude oil and natural gas from their initial supply sources to markets and/or storage facilities. We also are a supplier of power, generating electricity for companies that distribute energy to homes and businesses.
Adaptation and mitigation activities	Impacted	We contribute to a unified North American response to climate change through memberships in industry organizations, engagement with government and stakeholder representatives on climate change policy developments and funding research into GHG emissions reduction opportunities. We continue to engage with policy-makers and industry peers. In 2017: • We sponsored an independent study that was conducted by the Conference Board of Canada on Canadian Economic and Social Implications of Deep GHG Reductions and provided input to the Government of Canada on its commitment to reduce methane emissions in the oil and gas sector. • As a founding partner in the U.S. EPA's Natural Gas STAR Methane Challenge Program, which was launched in 2016, we continue to implement an industry-leading best management practice across our operations within five years, to address emission sources specified by the program. • We voluntarily provided the EPA with 2016 Natural Gas STAR methane reductions data for our U.S. Gas Operation facilities. TransCanada will continue participation in the program as implementation of these practices supports our commitment to developing innovative and economically effective solutions to reduce our GHG emissions footprint.
Investment in R&D	Impacted	Through development of world-class technologies, we are working hard to reduce GHG intensity of our operations and reduce energy use on our pipelines and other facilities: •When conducting natural gas pipeline maintenance, we use mobile compressors wherever possible to redirect natural gas into another section of pipeline thereby reducing the amount of natural gas released into the atmosphere •We have partnered with Rolls-Royce to conduct trials on a new generation of natural gas-powered turbines that move gas through our network with greater efficiency •We partner with other energy companies (Mistral, BC Hydro) to capture waste heat from our facilities for power generation eg, Crowsnest compressor station in SE BC uses waste exhaust heat from the facility's gas turbines to produce up to 6.5MW of clean electricity enough to meet the needs of 4000 households annually •We work to prevent leaks and reduce fugitive releases through our Pipeline and Facility Integrity programs. Our Fugitive Emissions Inspection and Leak Repair Program identifies leaks on pipeline and compressor station components (eg, valves), helping reduce releases of natural gas •In 2017 we implemented a new technology in Canada to improve tracking of our natural gas pipeline fugitive emissions data at valve sites, meter stations and compressor stations. The technology will improve operations and regulatory reporting activities resulting in improved ability to plan maintenance and analyze pipeline data •TransCanada is an industry leader in the development and implementation of pipeline repair methods that use in-service repair techniques, which eliminates or reduces emissions related to performing traditional pipeline repairs. Composite and steel reinforcement sleeves are now regularly used as a repair method rather than evacuating and performing a pipe cut-out and replacement. TransCanada has over two decades of experience of installing composite and steel reinforcement sleeves on our pipeline system •TransCanada is an active member of Pipeline Research Council International (PRCI)-an industry association where member companies collaboratively pursue advancements in technology solutions to improve design, construction and operation of pipeline facilities and equipment. Today PRCI is pursuing several research projects to reduce GHG and other emissions
Operations	Impacted	We own assets and have business interests in a number of regions subject to GHG emissions regulations, including GHG emissions management and carbon pricing policies. In 2017, we incurred \$63 million (2016 – \$62 million) of expense under existing carbon pricing programs. Across North America, there are a variety of new and evolving initiatives in development at the federal, regional, state and provincial level aimed at reducing GHG emissions. We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We support transparent climate change policies that lead to actual resolutions, allowing for sustainable and economically responsible natural resource development, but are appropriately flexible to adapt to economic realities and unintended outcomes. We expect that, over time, most of our assets will be subject to some form of regulation to manage GHG emissions. Changes in regulations may result in higher operating costs or other expenses, or higher capital expenditures to comply with possible new regulations.
Other, please specify	Please select	

C2.6

(C2.6) Describe where and how the identified risks and opportunities have factored into your financial planning process.

	Relevance	Description
Revenues	Impacted	Our business units provide financial forecasts and updates including consideration of: - Environmental Regulatory Risks - market rule or market design changes, changes in the interpretation and application of market rules by regulators, emission controls, emission costs and any permitting requirements for development projects - Climate - significant changes in temperature and other weather events and the impact on planning assumptions for demand, availability, commodity prices, efficiency and output capability
Operating costs	Impacted	Our business units provide financial forecasts and updates including consideration of: - Environmental Regulatory Risks - market rule or market design changes, changes in the interpretation and application of market rules by regulators, emission controls, emission costs and any permitting requirements for development projects - Climate - significant changes in temperature and other weather events and the impact on planning assumptions for demand, availability, commodity prices, efficiency and output capability
Capital expenditures / capital allocation	Impacted	'Capital expenditure forecasts generally include contingency amounts for higher capital expenditures required to comply with any anticipated new or changing regulations as well as amounts estimated for known and/or potential remediation obligations.
Acquisitions and divestments	Impacted	The impact of climate considerations and the regulatory environment are included in portfolio management planning through the assessment and pricing of risks/returns, scenario planning assumptions and on-going diversification efforts.
Access to capital	Impacted	In our on-going evaluation and management of our capital needs, we have undertaken various efforts to increase the transparency and integration of environment, social and governance considerations in our interactions with our various stakeholders, including banks and fixed income and equity investors.
Assets	Impacted	'Although difficult to estimate accurately, the potential impacts of compliance and potential liabilities are considered in the financial forecast process. Forecasts are updated regularly to reflect any known changes as a result of compliance and/or potential liabilities - Compliance - our assets are subject to federal, state, provincial and local environmental statutes and regulations governing environmental protection, including air and GHG emissions, water quality, species at risk, wastewater discharges and waste management. Building and operating our assets requires obtaining and complying with a wide variety of environmental registrations, licenses, permits and other approvals and requirements
Liabilities	Impacted	'Although difficult to estimate accurately, the potential impacts of compliance and potential liabilities are considered in the financial forecast process. Forecasts are updated regularly to reflect any known changes as a result of compliance and/or potential liabilities - Potential Liabilities - Compliance obligations can result in significant costs associated with installing and maintaining pollution controls, fines and penalties results from any failure to comply and potential limitations on operations; remediation obligations can also result in significant costs associated with the investigation and remediation of contaminated properties and with damage claims arising from the contamination of properties
Other	Please select	

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, qualitative and quantitative

C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b)

(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

No, we do not have a low-carbon transition plan

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

i) How strategy has been influenced (process for collecting and reporting information to influence strategy)

The process for collecting and reporting climate change-related information to influence strategy is through implementing our Environment Program. Across North America, there are a variety of new and evolving initiatives in development at the federal, regional, state and provincial level aimed at reducing GHG emissions. We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We support transparent climate change policies that lead to actual resolutions, allowing for sustainable and economically responsible natural resource development, but are appropriately flexible to adapt to economic realities and unintended outcomes. We expect that, over time, most of our assets will be subject to some form of regulation to manage GHG emissions. Changes in regulations may result in higher operating costs or other expenses, or higher capital expenditures to comply with possible new regulations.

ii) Example of how strategy has been influenced

An example of strategy influenced by climate change issues is in TransCanada's Energy business, which includes a portfolio of power generation assets in Canada and the U.S., and unregulated natural gas storage assets in Alberta. One component of the Energy business strategy to pursue opportunities in the power generation business as North America transitions to less carbon-intensive sources of power, a shift that aligns with our experience in building and operating high-efficiency gas-fired generation, renewable power and nuclear generation in Ontario. We have entered into a very significant agreement with the Ontario Independent Electricity System Operator (IESO) to extend the operating life of the Bruce Power nuclear facility to 2064. This agreement secures reliable, affordable, emission-less power for Ontario residents for many decades to come.

iii) How short term strategy has been influenced by climate change

TransCanada's short-term strategy has been influenced by climate change. A key component of TransCanada's overall business strategy is to commercially develop and build new asset investment programs. 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. Our past and present investments in natural gas, nuclear, wind and solar generating facilities demonstrates our commitment to clean, sustainable energy.

iv) How long term strategy has been influenced by climate change

TransCanada's long-term (10+ years) strategy has been influenced by climate change. We have 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.

v) Strategic advantage gain

TransCanada is building a competitive advantage by focusing on investing in low-carbon infrastructure that has and may continue to be a core element of our continued capital program. The growth in demand for power in North America coupled with an aging electrical infrastructure base and a societal preference for lower carbon intensive electricity production is expected to provide us with the opportunity to participate in new generation and other power infrastructure projects.

vi) Most substantial business decision influenced by climate change

The most substantial business decision during 2017 which was influenced by climate change was the continued advancement of the Keystone XL pipeline project. Specifically, climate change aspects related to water, oil sands GHG emissions & regulatory risk influenced this business decision. The previous U.S. Administration denied a Presidential Permit for the Project on the basis that

approval would undermine U.S. climate leadership and, therefore, would not serve the national interest. However, between 2008 and 2014, the State Department concluded five times that the Keystone XL Pipeline would not result in increased production and consumption of crude oil, and therefore would not significantly increase global GHG emissions. In March 2017, the U.S. Department of State issued a U.S. Presidential Permit authorizing construction of the U.S./Canada border crossing facilities of the Keystone XL pipeline.

C3.1d

(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios	Details
IEA 450	In 2017 TransCanada received a shareholder proposal to report on how the company is assessing long-term risks and opportunities in relation to climate change and the current transition to a low-carbon economy. TransCanada’s Board and management, in its Management Information Circular, recommended voting for this proposal at its Annual General Meeting on April 27, 2018. TransCanada understands that shareholders and other stakeholders want more information on how the company is addressing climate change and associated risks. As the tools available to assess the risks and opportunities associated with climate change improve, we are utilizing them in order to increase the rigour of our assessment, as a key input into our strategic planning process. TransCanada is committed to continually improve our disclosure and as such is planning to employ the IHS 2°C Scenario in 2018 when updating its business strategy.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Both absolute and intensity targets

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Scope

Scope 1

% emissions in Scope

1

% reduction from base year

20

Base year

2010

Start year

2013

Base year emissions covered by target (metric tons CO2e)

118352

Target year

2020

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% achieved (emissions)

Target status

Underway

Please explain

Québec and California have GHG cap and trade programs linked under the Western Climate Initiative (WCI) GHG emissions market. In Québec, the Bécancour cogeneration plant is required to cover its GHG emissions. The Canadian Mainline natural gas pipeline facilities in Québec are also covered under this program.

Target reference number

Abs 2

Scope

Scope 1

% emissions in Scope

% reduction from base year

Base year

Start year

2013

Base year emissions covered by target (metric tons CO2e)

Target year

2020

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% achieved (emissions)

Target status

Underway

Please explain

Québec and California have GHG cap and trade programs linked under the Western Climate Initiative (WCI) GHG emissions market. In California, TransCanada has costs associated with the cap and trade program from our power marketing activities.

Target reference number

Abs 3

Scope

Scope 1

% emissions in Scope

27.5

% reduction from base year

10

Base year

2009

Start year

2009

Base year emissions covered by target (metric tons CO2e)

2269667

Target year

2018

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% achieved (emissions)

Target status

Underway

Please explain

U.S. northeastern states that are members of the Regional Greenhouse Gas Initiative (RGGI) have implemented a CO2 cap and trade program for electricity generators. This program applies to both the Ravenswood and Ocean State Power generation facilities. In June 2017 we closed the sale of Ravenswood and Ocean State Power.

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Scope

Scope 1

% emissions in Scope

26.3

% reduction from baseline year

20

Metric

Metric tons CO2e per unit of production

Base year

2009

Start year

2007

Normalized baseline year emissions covered by target (metric tons CO2e)

0.0372

Target year

2017

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% achieved (emissions)

Target status

Underway

Please explain

Under the Specified Gas Emitters Regulation (SGER) in Alberta, established industrial facilities with GHG emissions above a certain threshold must reduce their emissions below an intensity baseline. The SGER program covers our natural gas pipelines in the province. The base year is an average of 2008-2009 annual emissions intensities.

% change anticipated in absolute Scope 1+2 emissions

3.1

% change anticipated in absolute Scope 3 emissions

0

Target reference number

Int 2

Scope

Scope 1

% emissions in Scope

11.7

% reduction from baseline year

20

Metric

Metric tons CO2e per unit of production

Base year

2007

Start year

2007

Normalized baseline year emissions covered by target (metric tons CO2e)

0.06376

Target year

2017

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% achieved (emissions)

Target status

Underway

Please explain

Under the Specified Gas Emitters Regulation (SGER) in Alberta, established industrial facilities with GHG emissions above a certain threshold must reduce their emissions below an intensity baseline. The SGER program covers our energy assets in the province. The base year is specific to each facility and varies from 2004-2007.

% change anticipated in absolute Scope 1+2 emissions

48.7

% change anticipated in absolute Scope 3 emissions

0

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

Target

Other, please specify (Avoided Emissions Intensity)

KPI – Metric numerator

Volume of direct GHG emissions avoided from an activity

KPI – Metric denominator (intensity targets only)

Total volume of direct GHG emissions

Base year

2017

Start year

2017

Target year

2018

KPI in baseline year

KPI in target year

% achieved in reporting year

Target Status

Please select

Please explain

To capture and recognize efforts to reduce emissions, TransCanada established this metric to create a baseline in 2017.

Part of emissions target

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

C-OG4.2a

(C-OG4.2a) Explain, for your oil and gas production activities, why you do not have a methane-specific emissions reduction target or do not incorporate methane into your targets reported in C4.2; and forecast how your methane emissions will change over the next five years.

TransCanada's internal avoided emissions intensity metric was designed with a focus on avoiding methane emissions; however, it was determined the metric would be less effective for measuring reduced total GHG emissions if it excluded combustion emissions as combustion emissions comprise over 90% of TransCanada's total GHG emissions.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	
To be implemented*	0	
Implementation commenced*	0	
Implemented*	5	850000
Not to be implemented	0	

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Activity type

Process emissions reductions

Description of activity

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

850000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

5340000

Investment required (unit currency – as specified in CC0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Pull-Down Compressors Stage of Development: Implemented Description: A blowdown is the act of releasing natural gas from a section of pipeline so that pipeline maintenance can be done safely. Several valves are closed to isolate that section of the pipeline and then open a special blowdown valve to release any natural gas. Whenever possible, TransCanada will transport a piece of equipment, known as a “pull-down compressor,” to the site of a blowdown. This machine is attached to the blowdown valve and instead of being released into the air most of the natural gas is pumped into another section of the pipeline. This reduces the amount of methane released into the atmosphere. TransCanada has built its fleet of pull-down compressors since the 1970s. The use of pull-down compressors avoids the release of natural gas into the atmosphere. The annual tCO2e savings from this avoided gas release are estimated. Average annual natural gas spot price in 2017 via Alberta Energy Regulator: Commodity Prices: Natural Gas Prices. Note that this is an assumption given TransCanada’s extensive pipeline operations.

Activity type

Fugitive emissions reductions

Description of activity

Oil/natural gas methane leak capture/prevention

Estimated annual CO2e savings (metric tonnes CO2e)

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

Investment required (unit currency – as specified in CC0.4)

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Fugitive and Vented Methane Emissions Reduction Stage of Development: Implemented Description: TransCanada has rigorously managed fugitive emissions from its Canadian natural gas pipeline system for over a decade through a Fugitive Emissions Inspection and Leak Repair (FEILR) program. The FEILR program involves identifying leaks on pipeline and compressor station components (such as valves), setting priorities and conducting repairs. As part of this system-wide effort, TransCanada has been influential in the development and implementation of leak detection technologies for our industry.

Activity type

Process emissions reductions

Description of activity

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

Investment required (unit currency – as specified in CC0.4)

Payback period

Please select

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Hot tapping for in service pipeline connections Stage of Development: Implemented Description: Hot tapping is an alternative procedure that makes a new pipeline connection while the pipeline remains in service, flowing natural gas under pressure. The hot tap involves attaching a branch connection and valve on the outside of an operating pipeline, and then cutting out the pipeline wall within the branch and removing the wall section through the valve. Hot tapping avoids product loss, methane emissions, and disruption of service to customers. While hot tapping is not a new practice, recent design improvements have reduced the complications and uncertainty operators might have experienced in the past. TransCanada uses hot tap procedures as often as possible on small jobs performed more often while larger taps (greater than 12 inches) are made only a handful of times per year. By performing hot taps, TransCanada is able to reduce methane loss and costs to our shippers.

Activity type

Energy efficiency: Processes

Description of activity

Reuse of steam

Estimated annual CO2e savings (metric tonnes CO2e)

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

Investment required (unit currency – as specified in CC0.4)

Payback period

Please select

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Waste-Heat Recovery Units Stage of Development: Implemented Description: TransCanada provides access to the waste heat while a third party owns and operates the heat recovery facilities, independent from TransCanada's natural gas pipeline business. TransCanada continues to build on its demonstrated experience of power generation from waste heat recovery. TransCanada continues to pursue opportunities for third parties to develop, own and operate waste heat recovery units at other compressor stations.

Activity type

Fugitive emissions reductions

Description of activity

Oil/natural gas methane leak capture/prevention

Estimated annual CO2e savings (metric tonnes CO2e)**Scope**

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)**Investment required (unit currency – as specified in CC0.4)****Payback period**

Please select

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Tracking Fugitive Emissions Data Stage of Development: Implemented Description: TransCanada tracks Canadian Gas Operations fugitive emissions data at our pipeline valve sites, meter stations and compressor stations. This enables field technicians to enter data online and with fewer steps. This should result in an improved ability to plan maintenance work and analyze pipeline data.

Activity type

Process emissions reductions

Description of activity

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)**Scope**

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)**Investment required (unit currency – as specified in CC0.4)****Payback period**

Please select

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Error in Variable Model (EVM) in Tuning Complex Pipeline Networks Stage of Development: Under investigation (Research and development) Description: Better determination of the condition of pipelines through the proposed EVM would aid in

efficient operation of the natural gas transmission system, and improved scheduling of cleaning and pigging procedures to restore original condition of internal pipe surface. The net result is lower energy consumption and higher efficiency (and throughput) in operating the system, thereby resulting in lower GHG emissions.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	We own assets and have business interests in a number of regions subject to GHG emissions regulations, including GHG emissions management and carbon pricing policies. In 2017, we incurred \$63 million (2016 – \$62 million) of expense under existing carbon pricing programs. Across North America, there are a variety of new and evolving initiatives in development at the federal, regional, state and provincial level aimed at reducing GHG emissions. We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We support transparent climate change policies that lead to actual resolutions, allowing for sustainable and economically responsible natural resource development, but are appropriately flexible to adapt to economic realities and unintended outcomes. We expect that, over time, most of our assets will be subject to some form of regulation to manage GHG emissions. Changes in regulations may result in higher operating costs or other expenses, or higher capital expenditures to comply with possible new regulations.
Dedicated budget for low-carbon product R&D	TransCanada is committed to developing innovative and economically effective solutions to reduce its GHG footprint. We have one of the industry's largest research and development programs, with a focus on improving the safety and efficiency of our operations. Our work to improve the efficiency of our operations begins with investing in operational and process improvements that can lead to GHG emission reductions.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Product

Description of product/Group of products

Electricity generation

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Please select

% revenue from low carbon product(s) in the reporting year

27

Comment

Climate change is an important global issue and we recognize that many countries are committed to transitioning to a lower-carbon future. We support this transition and continue to play a key role in developing a balanced and sustainable energy future through our investment in new pipeline infrastructure, as well as reliable, low-carbon and emission-less energy sources and power generation.

C-EU4.6

(C-EU4.6) Describe your organization's efforts to reduce methane emissions from your electricity generation activities.

Power Generation Facilities perform fugitive emission inspections on a monthly or annual frequency depending on the location of the gas equipment (within the plant vs. outside the plant). Leaks are tagged if they cannot be repaired immediately and the repair activity is recorded for that piece of equipment.

In Alberta, our gas storage facilities are required to implement a program to detect and repair leaks associated with fugitive emissions as per AER Directive 60 (Upstream Petroleum Industry Flaring, Incinerating, and Venting). This program must meet or exceed the Canadian Association of Petroleum Producers (CAPP) Best Management Practice for Fugitive Emissions Management. In order to meet this requirement, our facilities conduct periodic fugitive emission inspections as described in our internal task package. In doing so, we can manage leaks and develop reliable equipment records all while ensuring compliance with the applicable provincial and federal regulatory requirements.

C-OG4.6

(C-OG4.6) Describe your organization's efforts to reduce methane emissions from oil and gas production activities.

TransCanada does not own or operate any oil and gas production assets.

COG4.7

(C-OG4.7) Does your organization conduct leak detection and repair (LDAR) or use other methods to find and fix fugitive methane emissions from oil and gas production activities?

No, this is not relevant to our operations

C-OG4.7b

(C-OG4.7b) Explain why you do not conduct LDAR or use other methods to find and fix fugitive methane emissions, and whether you have a plan to do so from your oil and gas production activities.

TransCanada does not own or operate any oil and gas production assets.

C-OG4.8

(C-OG4.8) If flaring is relevant to your oil and gas production activities, describe your organization's efforts to reduce flaring, including any flaring reduction targets.

TransCanada does not own or operate any oil and gas production assets.

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1 2015

Base year end

December 31 2015

Base year emissions (metric tons CO2e)

13100000

Comment

See question C5.2a

Scope 2 (location-based)

Base year start

January 1 2015

Base year end

December 31 2015

Base year emissions (metric tons CO2e)

190000

Comment

See question C5.2a

Scope 2 (market-based)

Base year start

January 1 2015

Base year end

December 31 2015

Base year emissions (metric tons CO2e)

Comment

See question C5.2a

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

Other, please specify (See comment)

REET and WCI/WBSCD – Greenhouse Gas Protocol to calculate Scope 2 emissions

C5.2a

(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

TransCanada calculates its GHG emissions using a combination of methods required by various regulations in different jurisdictions where we operate. We report our emissions to British Columbia, Alberta, Ontario, Québec, Environment and Climate Change Canada, the U.S. Environmental Protection Agency, California, Oregon, Washington, the Regional Greenhouse Gas Initiative, and Mexico's Ministry of Environment and Natural Resources (SEMARNAT). These methods can include direct measurement and emission factors in conjunction with operating conditions.

More specifically, carbon dioxide emissions are calculated based on fuel gas measurements at pipeline and power generation facilities. Methane emissions from pipelines are calculated using field reports for blowdowns and an extensive in-house set of emissions factors for calculating fugitive emissions. Nitrous oxide is calculated based on engine-specific emission factors.

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Row 1

Gross global Scope 1 emissions (metric tons CO2e)

12500000

End-year of reporting period

<Not Applicable>

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

Comment

TransCanada is not reporting a Scope 2, market-based figure.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Row 1

Scope 2, location-based

344019

Scope 2, market-based (if applicable)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source

Utility Electricity Consumption from Natural Gas Pipelines – U.S.

Relevance of Scope 1 emissions from this source

No emissions excluded

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why the source is excluded

We continue to develop processes and procedures to potentially improve collection of emissions data from these sources in the future.

Source

Power Assets – U.S.

Relevance of Scope 1 emissions from this source

No emissions excluded

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why the source is excluded

In June 2017 we closed the sale of Ravenswood, Ironwood and Ocean State Power. Energy consumption from these assets are included up to the point of sale. It is expected that the indirect emissions would not be significant compared to our overall emissions profile.

Source

Keystone Oil Pipeline – U.S. and Canada

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why the source is excluded

Our liquids pipelines are below applicable direct GHG reporting thresholds and it is expected that the direct emissions would not be significant compared to our overall emissions profile. Indirect GHG emissions are not relevant and are excluded from our CDP reporting boundary.

Source

Oil Storage – U.S. and Canada

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why the source is excluded

The Company's oil storage asset emissions have been estimated to be below applicable reporting thresholds and it is expected that the direct emissions from these assets would not be significant compared to our overall emissions profile.

Source

TransGas Natural Gas Pipeline System – Columbia

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why the source is excluded

The Company held an ownership interest in this pipeline. In August 2017 TransGas transferred its pipeline assets to Transportadora de Gas Internacional S.A. It is expected that the indirect emissions would not be significant compared to our overall emissions profile.

C6.5

(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Source is considered relevant only from an "Influence" relevance criterion. It is not from other criteria. Current TransCanada Scope 3 emissions inventory structure shows the category of emissions to not be a focus for GHG emissions management.

Capital goods

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Source is considered relevant from the potential "Size," "Influence," and "Risk" criteria. Current TransCanada Scope 3 emissions inventory structure shows the category of emissions to not be a focus for GHG emissions management.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

2308881

Emissions calculation methodology

PURCHASED ELECTRICITY: Inputs: (1) Annual electricity consumption; (2) Asset ownership %; (3)% load received from grid when power plant is offline. Emission Factors: Canada/US/Mexico Electricity Feedstock Life Cycle CO2E Emission Factors (GREET provides feedstock emissions factors based on generation type. Electricity generation mix % is sourced from 'Canada's Energy Future 2016 - Energy Supply and Demand Projections to 2040 - An Energy Market assessment'.) Methodology: To calculate CO2E emissions for (1) Natural Gas and Pipelines - Electricity consumption was multiplied by Asset Ownership % and electricity feedstock life cycle CO2E emission factor; (2) Energy - Electricity consumption was multiplied by Asset Ownership %, Load % from grid and electricity feedstock life cycle CO2E emission factor. FUEL CONSUMPTION: Inputs: (1) Fuel consumption by business line and country; (2) Ownership % by country and asset. Emission Factors: (1) Lower Heating Value for Natural Gas (GREET1_2017); (2) Natural CO2E Gas Emission Factors for Stationary Fuels and Electricity Generation (GREET1_2017). Methodology: To calculate CO2E emissions for (1) Natural Gas and Oil Pipelines - Total Fuel Purchased was multiplied by Lower Heating Value for Natural Gas and Natural Gas CO2E Emission Factor for Stationary Fuel; (2) Energy - Total Fuel Purchased was multiplied by Ownership % and Natural Gas CO2E Emission Factor for Electricity Generation. TRANSMISSION AND DISTRIBUTION (TandD) LOSSES: Inputs: Natural Gas Pipelines and Energy Scope 2 CO2E emissions. Emission Factors: Electric TandD loss factor (GREET1_2017). Methodology: To calculate CO2E emissions, Scope 2 CO2E Emissions was multiplied by "[1 / (1- TandD Loss Factor) -1]". AVIATION FUEL: Inputs: (1) Canada and US Annual total dollars spent on aviation fuel; (2) Estimated Fuel Price; (3) Bank of Canada closing exchange rate between US and Canadian dollars for Dec. 31st 2017. Emission Factors: (1) Lower heating value of Conventional Jet Fuel (GREET1_2017); (2) Jet Fuel Cycle CO2E Emission Factor (GREET1_2017). Methodology: To calculate CO2E emissions, Total Canadian dollars spent was multiplied by Estimated Fuel Price, Lower Heating Value of Conventional Jet Fuel and the Jet Fuel Cycle CO2E Emission Factor.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Source is considered relevant from all relevance criteria. Currently, it represents approximately 99% of Scope 3 Emissions Results.

Upstream transportation and distribution

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

5879

Emissions calculation methodology

Inputs: The primary inputs for calculating emissions from Upstream Transportation and Distribution are (1) Distance travelled in kilometers by Canadian and US fleet; (2) Fleet leased percentage in Canada and the US; (3) Distance travelled in kilometers by rental vehicles, Extensity and expensed travel; and (4) Fuel consumption (City and Highway combined) of Chevrolet Silverado 2500 HD in km/L (Natural Resources Canada - vehicles.nrcan.gc.ca). Emission Factors: (1) Light-duty Gasoline Trucks CO2E Emission Factor (Environment Canada, National Inventory Report 1990 - 2014, Part 2, Table A6-12: Emission Factors for Energy Mobile Combustion Sources). Methodology: To calculate Total CO2E emissions by country and vehicle category, the Fleet Distance was multiplied by the Fleet Lease %, Fuel Consumption and the Gasoline Trucks CO2E Emission Factor.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Source is considered relevant only from an "Influence" relevance criterion. Current TransCanada Scope 3 emissions inventory structure shows it to not be a focus for GHG emissions management.

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Source is considered relevant only from a "Risk" relevance criterion. It is not from other criteria. Current TransCanada Scope 3 emissions inventory structure shows the category of emissions to not be a focus for GHG emissions management.

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

9239

Emissions calculation methodology

Assessment of emissions estimates are directly from the organization's supply chain partners (i.e., Carlson Wagonlit Travel). Assumptions in the use of the methodology follows industry standards (i.e., Carbon Neutral Protocol). Methodology: The following formula was used to calculate emissions from Business Travel by Carlson Wagonlit Travel - "(LEG_MILES * 1.609) * UPLIFT * FACTOR". The 'Uplift' and 'Factor' will vary depending on the following criteria - (1) KM; (2) Supplier code (supplier code related to itinerary); (3) Travel type; (4) travel class and (5)Effective_date.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Source is considered relevant only from an "Influence" relevance criterion. Current TransCanada Scope 3 emissions inventory structure shows it to not be a focus for GHG emissions management.

Employee commuting

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Source is considered relevant only from an "Influence" relevance criterion. It is not from other criteria. Current TransCanada Scope 3 emissions inventory structure shows the category of emissions to not be a focus for GHG emissions management.

Upstream leased assets

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

15176

Emissions calculation methodology

Inputs: The primary inputs for calculating emissions from Upstream Leased Assets are (1) TransCanada building electricity consumption in Canada and the US and; (2) Occupancy percentage in Canadian office buildings. Emission Factors: (1) Canada Electrical CO2E Emission Factor by Province (National Inventory Report Greenhouse Gas Sources and Sinks in Canada 1990-2014, Part 3) and; (2) US Electrical CO2E Emission Factor by eGRID subregion (USEPA, eGRID2014, <https://www.epa.gov/energy/egrid>). Methodology: To calculate CO2E Emissions in Canada from building electricity, the Building Electricity Consumption was multiplied by the Building Occupancy % and Province Specific Electrical CO2E Emission Factor. To calculate CO2E Emissions in the US from building electricity, the Building Electricity Consumption was multiplied by the eGRID subregion specific Electrical CO2E Emission Factor

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Source is considered relevant only from an "Influence" relevance criterion. It is not from other criteria. Current TransCanada Scope 3 emissions inventory structure shows the category of emissions to not be a focus for GHG emissions management.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

The emission source category does not apply to TransCanada. In the energy business line, TransCanada emissions associated with electricity sold (Transmissions and Distribution) are reported under scope 3 emissions, category 3 (i.e., Fuel and energy related activities not included in Scope 1 & Scope 2). In the pipelines transportation business line, TransCanada has Transportation Service Agreements which allows TransCanada systems to receive gas from the Customer at the Customer's Receipt Points; and deliver gas to the Customer at the Customer's Delivery Points. Emissions from natural gas pipeline transportation are included in TransCanada Scope 1 and 2 emissions inventories.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

The emission source category does not apply to TransCanada. TransCanada does not provide intermediate products for further processing. Electricity is produced to be sold to end users. Natural gas and oil are transported, and are not owned or sold.

Use of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Use of Sold Products emission source includes uncountable emissions sources such as use of electricity sold and may include use of natural gas and oil transported (not owned) by TransCanada. TransCanada recognizes that emissions from end use of natural gas drive the natural gas supply chain (cradle-to-grave) emissions estimates. TransCanada GHG Inventory is focused on the assessment of emission sources where the organization can take action. On a supply chain basis, the emissions from electricity and natural gas end use make TransCanada Corporate direct emissions irrelevant. The exclusion of emissions from these sources is consistent with TransCanada organizational and structural boundaries.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

0

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

The emission source category does not apply to TransCanada. TransCanada is an energy infrastructure organization. There is not end-of life for energy services or products.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

0

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

The emission source category does not apply to TransCanada. Currently, TransCanada business structure does not have assets under this business approach.

Franchises

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

0

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

The emission source category does not apply to TransCanada. Currently, TransCanada business structure does not have assets under this business approach.

Investments

Evaluation status

Relevant, not yet calculated

Metric tonnes CO2e

Emissions calculation methodology

Greenhouse Gas Protocol - Technical Guidance for Calculating Scope 3 Emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Source is considered relevant from all relevance criterion. Emissions have not been calculated yet as the boundary definition approach (Capital Projects vs. Investments) has to be evaluated to identify the emission sources that apply to TransCanada Indirect Emissions Inventory.

Other (upstream)

Evaluation status

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Other (downstream)

Evaluation status

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

263

Metric numerator (Gross global combined Scope 1 and 2 emissions)

3000000

Metric denominator

Other, please specify (Billions of cubic feet (Bcf))

Metric denominator: Unit total

11400

Scope 2 figure used

Location-based

% change from previous year

10.2

Direction of change

Decreased

Reason for change

Metric tonnes CO2e per natural gas throughput (Bcf). This metric is relevant to our natural gas transmission pipelines in the U.S. and represents Scope 1+2 emissions only from those facilities. The relationship between natural gas transmission pipeline GHG emissions and the volume of gas transported is complex. The nature of a transmission network, such as a single, long-haul pipeline with few connections or points where gas is added and removed from the system, will have a different design (including operational equipment) and emissions profile than highly integrated networks with a large number of "branches" over a smaller geographic area. In addition, the amount of GHGs released during operation does not have a linear relationship to the volume of gas that is transported on the system (The utilization of compressor units and GHG emissions from combustion of natural gas are dictated by both the volume and distance of travel of gas being transported. As a result, comparing emissions intensities between natural gas transmission pipeline systems must consider of the type of pipeline network and the service that it is providing. The 10.2% decrease in intensity from 2016 to 2017 was due to changes in utilization.

Intensity figure

805

Metric numerator (Gross global combined Scope 1 and 2 emissions)

6000000

Metric denominator

Other, please specify (Billions of cubic feet (Bcf))

Metric denominator: Unit total

7400

Scope 2 figure used

Location-based

% change from previous year

18.8

Direction of change

Decreased

Reason for change

Metric tonnes CO₂e per natural gas throughput (Bcf). This metric is relevant to our natural gas transmission pipelines in Canada and represents Scope 1+2 emissions only from those facilities. The relationship between natural gas transmission pipeline GHG emissions and the volume of gas transported is complex. The nature of a transmission network, such as a single, long-haul pipeline with few connections or points where gas is added and removed from the system, will have a different design (including operational equipment) and emissions profile than highly integrated networks with a large number of "branches" over a smaller geographic area. In addition, the amount of GHGs released during operation does not have a linear relationship to the volume of gas that is transported on the system (The utilization of compressor units and GHG emissions from combustion of natural gas are dictated by both the volume and distance of travel of gas being transported. As a result, comparing emissions intensities between natural gas transmission pipeline systems must consider of the type of pipeline network and the service that it is providing. The 18.8% decrease in intensity from 2016 to 2017 was due to changes in utilization.

Intensity figure

150

Metric numerator (Gross global combined Scope 1 and 2 emissions)

44000

Metric denominator

Other, please specify (Billions of cubic feet (Bcf))

Metric denominator: Unit total

300

Scope 2 figure used

Location-based

% change from previous year

9.9

Direction of change

Increased

Reason for change

Metric tonnes CO₂e per natural gas throughput (Bcf). This metric is relevant to our natural gas transmission pipelines in Mexico and represents Scope 1+2 emissions only from those facilities. The relationship between natural gas transmission pipeline GHG emissions and the volume of gas transported is complex. The nature of a transmission network, such as a single, long-haul pipeline with few connections or points where gas is added and removed from the system, will have a different design (including operational equipment) and emissions profile than highly integrated networks with a large number of "branches" over a smaller geographic area. In addition, the amount of GHGs released during operation does not have a linear relationship to the volume of gas that is transported on the system (The utilization of compressor units and GHG emissions from combustion of natural gas are dictated by both the volume and distance of travel of gas being transported. As a result, comparing emissions intensities between natural gas transmission pipeline systems must consider of the type of pipeline network and the service that it is providing. The 9.9% increase in intensity from 2016 to 2017 was due to changes in utilization.

Intensity figure

0.08

Metric numerator (Gross global combined Scope 1 and 2 emissions)

3800000

Metric denominator

megawatt hour generated (MWh)

Metric denominator: Unit total

45100000

Scope 2 figure used

Location-based

% change from previous year

57.9

Direction of change

Decreased

Reason for change

Metric tonnes CO₂e per MWh produced. This metric is relevant to our Energy assets and measures Scope 1+2 emissions only from those facilities. The 57.9% decrease in intensity from 2016 and 2017 was due to the sale of Ravenswood, Ironwood and Ocean State Power. Note that many of TransCanada's electricity generating facilities also generate a heat product, which is not accounted for here. Therefore, an emissions intensity simply based on electricity generation is only partially representative of the Company's true emissions intensity.

C-OG6.12

(C-OG6.12) Provide the intensity figures for Scope 1 emissions (metric tons CO₂e) per unit of hydrocarbon category.

Unit of hydrocarbon category (denominator)

Other, please specify (MWh of Natural Gas and Electricity)

Metric tons CO₂e from hydrocarbon category per unit specified

0

% change from previous year

30

Direction of change

Decreased

Reason for change

US/Canada – divestures Mexico – more comprehensive data in 2017

Comment

Metric tons CO₂e from hydrocarbon category per unit specified is 0.002. Throughput in MMcf of Natural Gas for Pipelines was converted to MWh. This was summed with the MWh of Electricity consumed from generated electricity within Energy Assets. The total CO₂e emissions were then divided by MWh to get a corporate intensity for 2017 and 2016.

C-OG6.13

(C-OG6.13) Report your methane emissions as percentages of natural gas and hydrocarbon production or throughput.

Oil and gas business division

Downstream

Estimated total methane emitted expressed as % of natural gas production or throughput at given division

0.016

Estimated total methane emitted expressed as % of total hydrocarbon production or throughput at given division**Comment**

28.8% reduction in Canadian Mainline between 2017 and 2016.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
Other, please specify (Aggregated - CO2, CH4, N2O)	12500000	Other, please specify (See comments) • CO2 - IPCC Fifth Assessment Report (AR5 – 100 year) • CH4 - IPCC Fifth Assessment Report (AR5 – 100 year) • N2O - IPCC Fifth Assessment Report (AR5 – 100 year) • CO2 – IPCC Second Assessment Report (SAR – 100 year) • CH4 – IPCC Second Assessment Report (SAR – 100 year) • N2O – IPCC Second Assessment Report (SAR – 100 year) • CO2 – IPCC Fifth Assessment Report (AR5 – 100 year) • CH4 – IPCC Fifth Assessment Report (AR5 – 100 year) • N2O – IPCC Fifth Assessment Report (AR5 – 100 year)

C-EU7.1b

(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	0	0	0	0	
Combustion (Electric utilities)	3700000	300	0	3700000	52.2% reduction in 2017 versus 2016 due to divestiture of North East US assets.
Combustion (Gas utilities)					
Combustion (Other)					
Emissions not elsewhere classified					

C-OG7.1b

(C-OG7.1b) Break down your total gross global Scope 1 emissions from oil and gas value chain production activities by greenhouse gas type.

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives (Oil: Total)				
Fugitives (Oil: Venting)				
Fugitives (Oil: Flaring)				
Fugitives (Oil: E&P, excluding venting and flaring)				
Fugitives (Oil: All Other)				
Fugitives (Gas: Total)				
Fugitives (Gas: Venting)				
Fugitives (Gas: Flaring)				
Fugitives (Gas: E&P, excluding venting and flaring)				
Fugitives (Gas: Midstream)				
Fugitives (Gas: All other)	300	18100	435000	Transport/transmission, storage, distribution of gas
Combustion (Oil: Upstream, excluding flaring)				
Combustion (Gas: Upstream, excluding flaring)				
Combustion (Refining)				
Combustion (Chemicals production)				
Combustion (Electricity generation)				
Combustion (Other)	7300000	1200	7300000	
Process emissions				
Emission not elsewhere classified				

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Canada	8200000
United States of America	4200000
Mexico	77300

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By business division

C7.3a

(C7.3a) Break down your total gross global Scope 1 emissions by business division.

Business division	Scope 1 emissions (metric ton CO2e)
Natural Gas Pipelines	8700000
Liquids Pipelines	0
Energy	3800000
Transportation Fuel	62400

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility generation activities	3700000	<Not Applicable>	
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)		<Not Applicable>	
Oil and gas production activities (downstream)	8700000	<Not Applicable>	
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Canada	239699		676146	
United States of America	103081		181667	
Mexico	1240		2254	

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division

C7.6a

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Natural Gas Pipelines	335324	
Energy	8696	

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)			
Oil and gas production activities (downstream)	344019		Decrease of 2.7% in 2017 is considered immaterial and it is mainly attributed to decrease in electricity consumption on the Foothills pipeline system in Alberta and ANR Storage facilities in the US.
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption		<Not Applicable>		
Other emissions reduction activities		<Not Applicable>		
Divestment	3987680	Decreased	22.2	Divested North East US Power assets in 2017
Acquisitions		<Not Applicable>		
Mergers		<Not Applicable>		
Change in output		<Not Applicable>		
Change in methodology		<Not Applicable>		
Change in boundary		<Not Applicable>		
Change in physical operating conditions		<Not Applicable>		
Unidentified		<Not Applicable>		
Other		<Not Applicable>		

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 10% but less than or equal to 15%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)		54295017	54295017
Consumption of purchased or acquired electricity	<Not Applicable>		287345	287345
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	0	54582362	54582362

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Kerosene

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

600

MWh fuel consumed for the self-generation of electricity

600

MWh fuel consumed for self-generation of heat

MWh fuel consumed for self-generation of steam

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

Fuels (excluding feedstocks)

Natural Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

54288404

MWh fuel consumed for the self-generation of electricity

17225596

MWh fuel consumed for self-generation of heat

MWh fuel consumed for self-generation of steam

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

8543746

Fuels (excluding feedstocks)

Residual Fuel Oil

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

6013

MWh fuel consumed for the self-generation of electricity

6013

MWh fuel consumed for self-generation of heat

MWh fuel consumed for self-generation of steam

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Kerosene

Emission factor

Unit

Please select

Emission factor source

Comment

Various emission factors were used based on type of fuel / electricity, source of fuel / electricity and whether emissions to be calculated were Scope 1, Scope 2 or Scope 3. A comprehensive list of emission factors is documented by the Environment, Land and Indigenous Relations Team and is available upon request.

Natural Gas

Emission factor

Unit

Please select

Emission factor source

Comment

Various emission factors were used based on type of fuel / electricity, source of fuel / electricity and whether emissions to be calculated were Scope 1, Scope 2 or Scope 3. A comprehensive list of emission factors is documented by the Environment, Land and Indigenous Relations Team and is available upon request.

Residual Fuel Oil

Emission factor

Unit

Please select

Emission factor source

Comment

Various emission factors were used based on type of fuel / electricity, source of fuel / electricity and whether emissions to be calculated were Scope 1, Scope 2 or Scope 3. A comprehensive list of emission factors is documented by the Environment, Land and Indigenous Relations Team and is available upon request.

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	45100000	19100	2000000	
Heat	39000000	0	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

C-EU8.2e

(C-EU8.2e) For your electric utility activities, provide a breakdown of your total power plant capacity, generation, and related emissions during the reporting year by source.

Coal – hard

Nameplate capacity (MW)

Gross electricity generation (GWh)

Net electricity generation (GWh)

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

Lignite

Nameplate capacity (MW)

Gross electricity generation (GWh)

Net electricity generation (GWh)

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

Oil

Nameplate capacity (MW)

Gross electricity generation (GWh)

Net electricity generation (GWh)

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

Gas

Nameplate capacity (MW)

6437

Gross electricity generation (GWh)

7916

Net electricity generation (GWh)

7635

Absolute scope 1 emissions (metric tons CO2e)

3700000

Scope 1 emissions intensity (metric tons CO2e per GWh)

325

Comment

Nameplate capacity and gross electricity generation have been adjusted for 50% Portlands Energy Center ownership and the divestiture of USNE assets (100% ownership; with 3,818 MW of capacity divested in June 2017). In addition, Scope 1 emission intensity has incorporated steam output from our cogeneration facilities in Alberta and Quebec. Excluding steam output will result with an emissions intensity of 487 tons CO2e per GWh.

Biomass**Nameplate capacity (MW)****Gross electricity generation (GWh)****Net electricity generation (GWh)****Absolute scope 1 emissions (metric tons CO2e)****Scope 1 emissions intensity (metric tons CO2e per GWh)****Comment****Waste (non-biomass)****Nameplate capacity (MW)****Gross electricity generation (GWh)****Net electricity generation (GWh)****Absolute scope 1 emissions (metric tons CO2e)****Scope 1 emissions intensity (metric tons CO2e per GWh)****Comment****Nuclear****Nameplate capacity (MW)**

3099

Gross electricity generation (GWh)

24368

Net electricity generation (GWh)

24353

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Nameplate capacity and gross electricity generation has been adjusted for 48.4% TC ownership. Increase in electricity generation by 10% in 2017 versus 2016.

Geothermal**Nameplate capacity (MW)****Gross electricity generation (GWh)****Net electricity generation (GWh)****Absolute scope 1 emissions (metric tons CO2e)****Scope 1 emissions intensity (metric tons CO2e per GWh)****Comment**

Hydroelectric

Nameplate capacity (MW)

583

Gross electricity generation (GWh)

Net electricity generation (GWh)

600

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Nameplate capacity and gross electricity generation has been adjusted for divestiture of TC Hydro in April 2017. Decrease in electricity generation by 51% in 2017 versus 2016.

Wind

Nameplate capacity (MW)

517

Gross electricity generation (GWh)

Net electricity generation (GWh)

1223

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Nameplate capacity has been adjusted for 62% Cartier Wind ownership and divestiture of Kibby Wind in April 2017 (100% ownership). Decrease in electricity generation by 6.5% in 2017 versus 2016.

Solar

Nameplate capacity (MW)

76

Gross electricity generation (GWh)

Net electricity generation (GWh)

109

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Nameplate capacity has been adjusted for divestiture of Ontario Solar in October 2017. Decrease in electricity generation by 7.8% in 2017 versus 2016.

Other renewable

Nameplate capacity (MW)

Gross electricity generation (GWh)

Net electricity generation (GWh)

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

Other non-renewable

Nameplate capacity (MW)

Gross electricity generation (GWh)

Net electricity generation (GWh)

Absolute scope 1 emissions (metric tons CO2e)

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

Total

Nameplate capacity (MW)

10712

Gross electricity generation (GWh)

32284

Net electricity generation (GWh)

33920

Absolute scope 1 emissions (metric tons CO2e)

3700000

Scope 1 emissions intensity (metric tons CO2e per GWh)

Comment

C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor

Contract with suppliers or utilities (e.g. green tariff), not supported by energy attribute certificates

Low-carbon technology type

Solar PV

Wind

Hydropower

Nuclear

MWh consumed associated with low-carbon electricity, heat, steam or cooling

Emission factor (in units of metric tons CO2e per MWh)

Comment

TransCanada partially or fully owns electricity generation sources which are grid-connected. TransCanada power facilities consume self-generated electricity and electricity supplied from the grid. The MWh of consumed low-carbon electricity, heat, steam or cooling identified here represents TransCanada's electricity consumption from low-carbon electricity grids in British Columbia, Manitoba, Ontario and Quebec.

C-EU8.4

(C-EU8.4) Does your electric utility organization have a global transmission and distribution business?

No

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Other, please specify (Water)

Metric value

4.5

Metric numerator

Million cubic metres

Metric denominator (intensity metric only)**% change from previous year**

42

Direction of change

Decreased

Please explain

Volume of water taken is defined as water used for hydrostatic testing, and is reported only for Hydrostatic Testing for Canadian Pipelines and does not include tanks. Total power water consumption is inclusive of all TransCanada operations and assets, excludes the following operations and assets: • Once-through cooling water: once through-cooling water returned to the same source is not included in water consumption. • NE Hydro: hydro facilities are excluded from the water consumption metric • Mackay River: water consumption at Mackay River is accounted for by Suncor TransCanada uses the Dow Jones Sustainability Index (DJSI) definition for water consumption and defines it as water withdrawn, net of water discharged to the source with higher or equal quality. TransCanada's total water consumption is equivalent to the total of water withdrawn for the above listed facilities. None of our assets meets the DJSI criteria of discharged to the source with higher or equal quality. Discharged water is not returned to the source with equal or higher quality, and cannot be subtracted from water withdrawn to determine water consumption.

Description

Waste

Metric value

230423

Metric numerator

Metric tonnes

Metric denominator (intensity metric only)**% change from previous year**

400

Direction of change

Increased

Please explain

2017 data include operations, project, and remediation waste for the following TransCanada operated assets – Columbia Gas Transmission (wholly owned); ANR Pipeline (wholly owned); Great Lakes Gas Transmission (66% effective ownership); North Baja Pipeline (26.8% effective ownership); Gas Transmission Northwest (26.8% effective ownership); and Northern Border Pipeline (13.4% effective ownership). 2017 data does not include general trash, pipeline liquids and materials managed as off-specification/recoverable fuels, parts washers, universal waste and any other waste stream that went for recycling. The quantities include hazardous and non-hazardous waste as well as both solids and liquids Total solid waste disposed increased from 2016 to 2017 due to the acquisition of the assets from the Columbia Pipeline Group on July 1, 2016 and the inclusion of project and remediation waste in centralized waste management and waste tracking processes.

C-OG9.3a

(C-OG9.3a) Disclose your total refinery throughput capacity in the reporting year in thousand barrels per year.

Total refinery throughput capacity (Thousand barrels per day)	
Capacity	

C-OG9.3b

(C-OG9.3b) Disclose feedstocks processed in the reporting year in million barrels per year.

	Throughput (Million barrels)	Comment
Oil		
Other feedstocks		
Total		

C-OG9.3c

(C-OG9.3c) Are you able to break down your refinery products and net production?

No

C-EU9.5a

(C-EU9.5a) Break down, by source, your total planned CAPEX in your current CAPEX plan for power generation.

Primary power generation source	CAPEX planned for power generation from this source	Percentage of total CAPEX planned for power generation	End year of CAPEX plan	Comment
Gas	253451000	35	2018	
Nuclear	474519000	65	2018	For Nuclear: Equity accounted for investment. Accounted for as contribution to equity investment
Wind	1989000	0	2018	

C-EU9.5b

(C-EU9.5b) Break down your total planned CAPEX in your current CAPEX plan for products and services (e.g. smart grids, digitalization, etc.).

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Distributed generation	Electricity generated from natural gas, nuclear and wind.	729959000	100	2018

C-CO9.6/C-EU9.6/C-OG9.6

(C-CO9.6/C-EU9.6/C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.

Investment start date

January 1 2017

Investment end date

December 31 2017

Investment area

R&D

Technology area

Other, please specify (See comment)

Electric Utilities • Digital technology • Distributed energy resources • Energy storage • Renewable energy • Smart grids • Smart meters • Steam turbine and/or other component upgrades • Other, please specify Technologies focused on a cleaner, digital and decentralized energy future

Investment maturity

Large scale commercial deployment

Investment figure

25000000

Low-carbon investment percentage

0

Please explain

Our pipelines, oil and gas facilities and power plants are some of the most technologically advanced in the industry. We have one of the industry's largest research and development (R and D) programs and we are among Canada's top 100 corporate R and D spenders, according to Research Infosource Inc. Since 2013, we have dedicated approximately \$150 million toward technology development to support an internal research program as well as joint partners. For example, as part of our ongoing efforts in supporting R and D and innovation, in 2017 TransCanada committed to invest up to US\$25 million in Energy Impact Partners, a collaborative strategic investment firm, built upon a coalition of like-minded utility partners that invests in innovative technologies, services and products throughout the electricity supply chain from generation to consumption. Our investment provides capital for leading-edge companies that are, primary, at a growth stage and where the coalition of utility partners can help ensure investment success by partnering and utilization/purchasing these products/services which helps accelerate technology adoption. Our involvement with Energy Impact Partners also provides us with a better understanding of how our industry might be affected by emerging and disruptive technologies and gives us access to real-time feedback on the strategic interest in various technologies from other partners.

C-OG9.7

(C-OG9.7) Disclose the breakeven price (US\$/BOE) required for cash neutrality during the reporting year, i.e. where cash flow from operations covers CAPEX and dividends paid/ share buybacks.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

17 TCE AB Bear Creek - Verification Report.pdf
17 TCE AB Carseland - Verification Report.pdf
17 TCE AB MacKay River - Verification Report.pdf
17 TCE AB Redwater - Verification Report.pdf
17 TCPL AB Crossfield - Verification Report.pdf
17 TCPL AB Edson - Verification Report.pdf
17 TCPL AB System- Verification Report.pdf
2017 Halton Hills Verification Package.pdf
2017 Mainline Verification Package.pdf
VERREPR_TCE 2017.pdf
VERREPR_TCPL 2017.pdf
TCP-BCL-VS-EY-2017-V1.pdf

Page/ section reference

Relevant standard

Other, please specify (See comment)

• *Alberta Specified Gas Emitters Regulation (SGER)* • *ISO14064-3* • *Other, please specify – British Columbia Greenhouse Gas Reduction (Cap-and-Trade) Act Reporting Regulation, the British Columbia Reporting Regulation Guidance Document: Verification October 2012, Version 2.1 and the International Organization for Standardization ISO 14064-3:2006 Greenhouse Gases - Specification Ontario Climate Change Mitigation and Low-carbon Economy Act, 2016, S.O. 2016 and sections 27, 28, and 32 of Ontario Regulation 143/16 Quantification, Reporting and Verification of Greenhouse Gas Emissions. Quebec Environment Quality Act Regulation respecting mandatory reporting of certain emissions of containments into the atmosphere*

Proportion of reported emissions verified (%)

50

Scope

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

TCPL Limited Assurance Letter - Final.pdf

Page/ section reference

Relevant standard

ISAE 3410

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope

Scope 3- at least one applicable category

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Attach the statement

TCPL Limited Assurance Letter - Final.pdf

Page/section reference

Relevant standard

ISAE 3410

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C5. Emissions performance	Year on year change in emissions (Scope 2)	ISA 3410	Changes in GHG inventory year over year from December 31, 2016 to December 31, 2017 for both Scope 2 and Scope 3 GHG emissions were assured. For further information about this limited assurance please see the verification statement uploaded with question C10.
C6. Emissions data	Year on year change in emissions (Scope 3)	ISA 3410	Changes in GHG inventory year over year from December 31, 2016 to December 31, 2017 for both Scope 2 and Scope 3 GHG emissions were assured. For further information about this limited assurance please see the verification statement uploaded with question C10.

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

Alberta carbon tax
Alberta SGER
BC carbon tax
California CaT
Ontario CaT
Québec CaT
RGGI

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

Alberta SGER

% of Scope 1 emissions covered by the ETS

Period start date

January 1 2017

Period end date

December 31 2017

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Facilities we own and operate

Comment

Energy only, on an aggregate basis for 2017 - 2,478,225 metric tons CO₂e of verified emissions. This includes: Alberta SGER, California CaT, Ontario CaT, Quebec CaT, and RGGI. % of Scope 1 emissions covered by this ETS is baseline dependent.

California CaT

% of Scope 1 emissions covered by the ETS

100

Period start date

January 1 2017

Period end date

December 31 2017

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Facilities we own and operate

Comment

See comment in C11.b Alberta SGER % of Scope 1 emissions covered by this ETS could be up to 100%

Ontario CaT

% of Scope 1 emissions covered by the ETS

100

Period start date

January 1 2017

Period end date

December 31 2017

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Facilities we own and operate

Comment

See comment in C11.b Alberta SGER % of Scope 1 emissions covered by this ETS could be up to 100%

Québec CaT

% of Scope 1 emissions covered by the ETS

100

Period start date

January 1 2017

Period end date

December 31 2017

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Facilities we own and operate

Comment

See comment in C11.b Alberta SGER % of Scope 1 emissions covered by this ETS could be up to 100%

RGGI

% of Scope 1 emissions covered by the ETS

100

Period start date

January 1 2017

Period end date

December 31 2017

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Facilities we own and operate

Comment

See comment in C11.b Alberta SGER

C11.1c

(C11.1c) Complete the following table for each of the tax systems in which you participate.

Alberta carbon tax

Period start date

January 1 2017

Period end date

December 31 2017

% of emissions covered by tax

100

Total cost of tax paid

Comment

The percentage of emissions covered by this tax could be up to 100%. Alberta Carbon Tax (levy) was introduced in 2017 to cover purchases and uses of diesel, gasoline, natural gas and propane. Initially set at \$20 per tonne of carbon dioxide, the levy increased to \$30/tonne in 2018. The large facilities covered under the Specified Gas Emitters Regulation (SGER) in Alberta were exempted from the carbon tax in order to avoid double taxation.

BC carbon tax

Period start date

January 1 2017

Period end date

December 31 2017

% of emissions covered by tax

100

Total cost of tax paid

Comment

The percentage of emissions covered by this tax could be up to 100%. BC adopted their carbon tax system in 2008, the first broad-based carbon tax in North America. Applied to the purchase and use of fossil fuels, BC's carbon tax rate increased from \$30/tonne in 2017 to \$35/tonne in 2018.

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

We own assets and have business interests in a number of regions subject to GHG emissions regulations, including GHG emissions management and carbon pricing policies. Across North America, there are a variety of new and evolving initiatives in development at the federal, regional, state and provincial level aimed at reducing GHG emissions. We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We expect that, over time, most of our assets will be subject to some form of regulation to manage GHG emissions. Changes in regulations may result in higher operating costs or other expenses, or higher capital expenditures to comply with possible new regulations.

Future legislative and regulatory programs could significantly restrict emissions of GHGs including methane across our operations. The Government of Canada has proposed a deferral plan to have carbon pricing in place in all Canadian jurisdictions by 2019. The plan would expand GHG pricing coverage of TransCanada assets to provinces without a carbon pricing program at the time and is within the bounds of our previously anticipated changes to GHG regulations. The Alberta government announced a climate change policy, the Climate Leadership Plan (CLP), in 2015. This policy replaced the SGER program with the Carbon Competitiveness Incentive Regulation, a performance standard-based GHG pricing program, on January 1, 2018. Environment and Climate Change Canada issued a draft Methane Reduction regulation on May 27, 2017. The draft regulations detail requirements to reduce methane emissions through operational and capital modifications.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase

Credit purchase

Project type

Wind

Project identification

Chin Chute Wind Farm

Verified to which standard

Other, please specify (Alberta SGER - Offset System)

Number of credits (metric tonnes CO₂e)

19518

Number of credits (metric tonnes CO₂e): Risk adjusted volume

19518

Credits cancelled

No

Purpose, e.g. compliance

Compliance

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Navigate GHG regulations

Stress test investments

Other, please specify (See comment)

TransCanada incorporates an expected future cost of carbon emissions into economic analyses of new investments and existing assets. Across North America there are a variety of new and evolving initiatives in development at the federal, regional, state and provincial level aimed at achieving GHG emission reductions. We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We expect that, over time, most of our facilities will be subject to some form of regulation to manage GHG emissions.

GHG Scope

Scope 1

Application

Company-wide (with local variations accepted)

Actual price(s) used (Currency /metric ton)

80

Variance of price(s) used

Our price varies over time and across geographies, and our currency varies over geographies – for example, TransCanada is already regulated with carbon pricing in British Columbia, Alberta, Ontario, Quebec, California and the U.S. northeast Regional Greenhouse Gas Initiative (RGGI). TransCanada has an internal, multi-disciplinary team that continuously refines the Company's strategy for managing climate change risks and opportunities, including carbon price forecasts. Actual price(s) used is up to \$80/metric ton.

Type of internal carbon price

Shadow price

Impact & implication

TransCanada understands that shareholders and other stakeholders want more information on how the company is addressing climate change and associated risks. As the tools available to assess the risks and opportunities associated with climate change improve, we are utilizing them in order to increase the rigour of our assessment, as a key input into our strategic planning process.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Other, please specify (See comment)

We choose the following selection that is currently not available in the list: ● Climate change is integrated into supplier evaluation processes

% of suppliers by number

% total procurement spend (direct and indirect)

% Scope 3 emissions as reported in C6.5

0

Rationale for the coverage of your engagement

Impact of engagement, including measures of success

Comment

During our suppliers' pre-qualification process, we ask our "Environmental Services" suppliers about their "Waste Disposal Policy and Hazardous Materials Management Program". These questions relate to "Climate Change" and "Carbon Emission Reductions" initiatives.

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Other, please specify (Other-information provided below)

Details of engagement

<Not Applicable>

Size of engagement

% Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

While we have not had engagement sessions with our customers on our GHG emissions and climate change strategies, TransCanada has engaged with our customers with respect to the introduction of the climate change policies that have been legislated across Canada, and how those policies may impact the costs and operation our assets. In addition, TransCanada's Corporate Responsibility Report is a public document for all of our stakeholders to view online. TransCanada is working on requests for connections from customers who are establishing businesses that will facilitate reductions such as Compressed Natural Gas and Renewable Natural Gas facilities.

Impact of engagement, including measures of success

Impact of engagement and success is determined long-term as TransCanada anticipates that most of our facilities will be subject to future regulations to manage industrial GHG emissions, and we have procedures in place to help ensure our compliance with these regulations.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

- Direct engagement with policy makers
 - Trade associations
 - Funding research organizations
 - Other
-

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Other, please specify (See comment) <i>Pan-Canadian Framework on Clean Growth and Climate Change</i>	Support with minor exceptions	TransCanada provided comments on the Government of Canada Pan-Canadian Framework on Clean Growth and Climate Change, which builds on the Vancouver Declaration on Clean Growth and Climate Change.	TransCanada agrees with the general direction of the Declaration, particularly our shared recognition of the need to address environmental objectives while ensuring the responsible development of the energy resources that North Americans need to fuel our everyday lives.
Regulation of methane emissions	Support with minor exceptions	TransCanada provided comments on the Government of Canada's outreach on its commitment to reduce methane emissions from the oil and gas sector by 40-45% below 2012 levels by 2025. TransCanada also participated in data gathering, analysis and communication via industry associations.	While the natural gas transmission sector supports the Government of Canada's goal to reduce methane emissions from the oil and gas sector, in light of the relatively small contribution of GHG emissions from pipeline operations, it is important that government policy in this arena appropriately balance the cost and burden on the industry of regulatory action designed to reduce emissions with the limited ability to affect further meaningful reductions.
Regulation of methane emissions	Support with minor exceptions	TransCanada and industry peers met with the U.S. Environmental Protection Agency to discuss their developing policy related to reducing methane emissions for equipment at natural gas transmission compressor stations and storage.	TransCanada recognizes stakeholder concerns related to increasing carbon emissions and the need for sensible public policy frameworks focused on managing emissions. We recognize that a unified North American response to climate change and air quality issues will ensure competitiveness and must be maintained or enhanced while working toward solutions to manage GHG and air emissions. TransCanada supports responsible government policies that manage GHG emissions while balancing other North American priorities, including social and economic wellbeing. TransCanada advocates for policies across North America that recognize the role that natural gas can play in mitigating GHG emissions.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Canadian Energy Pipelines Association (CEPA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

For the last 10 years, the Canadian Energy Pipeline Association (CEPA) has participated in industry, government and other stakeholder forums that address the challenge of climate change in Canada. CEPA supports GHG emission regulations that include price certainty and achievable targets. CEPA endorses the idea of a technology fund as a compliance mechanism. If cap and trade is implemented, it must be harmonized across jurisdictions and ensure competitiveness between jurisdictions. CEPA believes that climate change policy should: Connect energy with the environment; Solve the energy challenges that impact North Americans; Encourage continued investment in activities that reduce environmental footprints and are consistent with the triple E bottom line; and, Be harmonized across jurisdictions within Canada, to an extent that is reasonable and practical.

How have you, or are you attempting to, influence the position?

TransCanada is an active participant in the development of public policy positions and contributes to the outcomes of meetings.

Trade association

Interstate Natural Gas Association of America (INGAA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Climate change is an important issue. Increased use of natural gas is helping to combat climate change by lowering carbon dioxide emissions. While U.S. gas production is up 37 per cent since 1990, greenhouse gas emissions are down 17 per cent. Because natural gas is made of methane, a greenhouse gas, the natural gas industry is hard at work lowering those emissions. The natural gas pipeline industry is tackling methane emissions through the further refinement of its system. In the past 30 years, the industry has reduced the number of pipeline leaks by 94 percent through pipeline integrity and maintenance programs and continued investment in new pipeline facilities. That has prevented emission of 122 million metric tons of carbon dioxide-equivalent. That is like eliminating a yearlong 25 million car traffic jam, enough to wrap the earth three times. We are also looking for ways to reduce releases from compressor equipment by establishing industry guidelines with a particular focus on equipment with the largest-emissions profile. Natural gas has an important role in helping the nation become a larger user of renewable energy, like wind and solar in electric generation. It is the number one "back stop" to ensure we continue to have electricity even when the sun isn't shining or the wind isn't blowing. Currently, we are working with INGAA in the United States to provide input and guidance on proposals, including, but not limited to, various commitments, practices and initiatives that supports methane reduction.

How have you, or are you attempting to, influence the position?

TransCanada is an active participant in the development of public policy positions and contributes to the outcomes of meetings.

Trade association

American Petroleum Institute (API)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Oil and natural gas take us down the street and around the world. They warm and cool our homes and businesses. They provide the ingredients for medicines, fertilizers, fabrics, plastics and other products that make life safer, easier and better. While we rely on them for most of our energy and will likely do so for years to come, as the Environmental Protection Agency (EPA) notes: "Scientists are certain that human activities are changing the composition of the atmosphere, and that increasing the concentration of greenhouse gases will change the planet's climate. However, they are not sure by how much it will change, at what rate it will change, or what the exact effects will be." Despite these uncertainties it is clear that climate change is a serious issue that requires research for solutions and effective policies that allow us to meet our energy needs while protecting the environment. That's why oil and gas companies are working to reduce their greenhouse gas emissions. The oil and gas industry has also been implementing new emissions estimation and tracking tools to enable it to assess how well it is meeting the goals it has set for itself and report progress to the public. On other fronts, companies are reducing natural gas flaring to cut emissions (while also adding to energy supplies) and storing CO2 underground, where it can be safely held for thousands of years. This is just a small sample of industry efforts to be part of the solution in meeting this global challenge. We are already major contributors to the national effort to reduce greenhouse gas emissions, and are eager participants in developing the best science-based, transparent, and cost-effective policies to protect and expand our economic and environmental progress.

How have you, or are you attempting to, influence the position?

TransCanada is a participant in the development of public policy positions and contributes to the outcomes of meetings.

Trade association

Canadian Electricity Association (CEA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The Canadian electricity industry is committed to taking action on climate change and improving environmental performance while maintaining a reliable and cost-effective supply of electricity. Electricity generators have already made gains in areas such as low-emission technologies, energy efficiency, emerging renewable power, and emission offsets. Currently, the electricity industry is working cooperatively with the federal government to find an equitable approach for emission reductions. Measures to address electricity sector GHG emissions and broader air issues must be designed, however, to address the diversity of technologies, fuel/generation sources, environmental pressures, political and socio-economic climates from region to region. Strategies adopted to address these issues generally adhere to a set of principles aimed at optimizing solutions: •Continued provision of safe, cost-

effective, and reliable electricity; •Integrated management of GHGs and other air pollutant emissions (SO₂, NO_x, PM, Hg, and CO₂); •Accommodation of full fuel/generation source diversity; •Consideration of regional differences, in electricity supply and demand as well as air quality issues; •Flexibility of implementation mechanisms, allowing a full array of market and other instruments; and •Consideration of GHG policies of the U.S., Canada's primary trading partner.

How have you, or are you attempting to, influence the position?

TransCanada is an active participant in the development of public policy positions and contributes to the outcomes of meetings.

Trade association

International Emissions Trading Association (IETA)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

IETA is a non-profit business organization created in 1999 to serve businesses engaged in the new field of carbon markets. Our objective is to build international policy and market frameworks for reducing greenhouse gases at lowest cost.

How have you, or are you attempting to, influence the position?

TransCanada is a participant in the development of public policy positions and contributes to the outcomes of meetings.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

TransCanada is a participant in the Carbon Pricing Leadership Coalition (CPLC). The CPLC brings together leaders from across government bodies, the private sector and civil society to share experiences working with carbon pricing and to expand the evidence base for the most effective carbon pricing systems and policies. We see the CPLC as a leading multi-stakeholder initiative bringing together national and sub-national governments, the private sector and civil society to develop knowledge regarding carbon pricing and its effective and broad implementation to achieve economic, environmental and social goals. We look C6.10 to the opportunity to share our experience, collaborate and learn from multi-stakeholder leaders in successful carbon pricing systems.

TransCanada is also a member of the Pipeline Research Council International (PRCI). PRCI is a global collaborative research development organization with membership from the world's leading pipeline companies, and the vendors, service providers, equipment manufacturers and other organizations supporting our industry. Research is planned and developed through Technical Committees. For example, the Integrity & Inspection Technical Committee which conducts research to improve the reliability of pipeline infrastructure and ensure the continuity of public service through the development and successful deployment of technologies associated with mechanical damage, pipeline integrity management, and associated inspection technologies. The Operations, & Monitoring (SOM) Technical Committee research aims to improve the integrity of pipeline infrastructure and the continuity of public service through the development and successful deployment of technologies identify right-of-way threats, leak detection, and damage prevention.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

To implement, TransCanada uses an internal team to continuously refine the Company's activities which may influence climate policy. This group provides input and expertise as appropriate to inform policy response strategies and ensure consistency. The team includes members of corporate groups (e.g. climate policy and governance, GHG reporting, government relations, industry relations, legal, and regulatory services); representatives from business segments (e.g. commercial teams); and, external stakeholders (e.g. professional peers, industry associations, non-governmental organizations) all of whom are utilized, as appropriate, in response to policy developments in order to establish an understanding of policy and implications and to identify potential response strategies. The positions are reviewed, as appropriate, in an effort to ensure engagement is consistent.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

TransCanada 2017 Annual Report (<https://www.transcanada.com/globalassets/pdfs/investors/reports-and-filings/annual-and-quarterly-reports/2017/transcanada-2017-annual-report.pdf>) *Opportunities* Pg. 4, 55, 83, 85-86

Status

Complete

Attach the document

transcanada-2017-annual-report.pdf

Content elements

Risks & opportunities

Publication

In mainstream reports

TransCanada 2017 Annual Information Form (<https://www.transcanada.com/globalassets/pdfs/investors/shareholders/historical-information/tcpl-regulatory-filings/2016/transcanada-2016-annual-information-form.pdf>) *Pg. 16, 22*

Status

Complete

Attach the document

transcanada-2016-annual-information-form.pdf

Content elements

Risks & opportunities

Publication

In mainstream reports

TransCanada Management Information Circular February 20, 2018 (<https://www.transcanada.com/globalassets/pdfs/investors/reports-and-filings/regulatory-filings/2018/transcanada-2018-management-information-circular.pdf>) *Pg. 113-114*

Status

Complete

Attach the document

transcanada-2018-management-information-circular.pdf

Content elements

Governance

Strategy

Risks & opportunities

Publication

In voluntary communications

TransCanada Climate Change website (<https://www.transcanada.com/en/commitment/environment/climate-change/>) Whole document

Status

Complete

Attach the document**Content elements**

Governance
Strategy
Risks & opportunities
Emissions figures
Other metrics

Publication

In voluntary communications

TransCanada Climate Change Fact Sheet (March 2017) Whole document

Status

Complete

Attach the document

We care about climate change.pdf

Content elements

Strategy

Publication

In voluntary sustainability report

*TransCanada 2017 Corporate Responsibility (CR) Report
(<https://www.transcanada.com/globalassets/pdfs/commitment/transcanada-csr-report.pdf#page=42>) Pg. 42-46, 62-64*

Status

Complete

Attach the document

transcanada-csr-report.pdf

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Other metrics

Publication

In voluntary sustainability report

*TransCanada 2017 Corporate Responsibility (CR) Report Data Sheet
(<https://www.transcanada.com/globalassets/pdfs/commitment/transcanada-2017-cr-report-data-sheet.pdf>) Pg. 13-14*

Status

Complete

Attach the document

transcanada-2017-cr-report-data-sheet.pdf

Content elements

Emissions figures
Other metrics

C14. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

Throughout this CDP Climate Change response, the terms, we, us, our, TC, the Company and TransCanada mean TransCanada Corporation and its subsidiaries. Abbreviations and acronyms that are not defined in the document are defined in the glossary on page 108 of the TransCanada 2017 Annual Report. Unless noted otherwise, all information is as of December 31, 2017 and all amounts are in Canadian dollars.

FORWARD-LOOKING INFORMATION

We provide forward-looking information in our CDP Climate Change response as necessary in order to provide a complete and thorough response that is informed by management's assessment of our future plans, outlook and prospects overall. Statements that are forward-looking are based on certain assumptions and on what we know and expect today and generally include words like anticipate, expect, believe, may, will, should, estimate or other similar words. Forward-looking statements in this CDP Climate Change response may include information about the following, among other things: • planned changes in our • our financial and operational performance, including the performance of our subsidiaries • expectations or projections about strategies and goals for growth and expansion • expected cash flows and future financing options available to us • expected dividend growth • expected costs for planned projects, including projects under construction, permitting and in development • expected schedules for planned projects (including anticipated construction and completion dates) • expected regulatory processes and outcomes • expected outcomes with respect to legal proceedings, including arbitration and insurance claims • expected capital expenditures and contractual obligations • expected operating and financial results • the expected impact of future accounting changes, commitments and contingent liabilities • the expected impact of U.S. Tax Reform; • expected industry, market and economic conditions. Forward-looking statements do not guarantee future performance. Actual events and results could be significantly different because of assumptions, risks or uncertainties related to our business or events that happen after the date of this CDP Climate Change. Our forward-looking information is based on the following key assumptions, and subject to the following risks and uncertainties: Assumptions • planned wind down of our U.S. Northeast power marketing business • inflation rates and commodity prices • nature and scope of hedging • regulatory decisions and outcomes • interest, tax and foreign exchange rates, including the impact of U.S. Tax Reform • planned and unplanned outages and the use of our pipeline and energy assets • integrity and reliability of our assets • access to capital markets • anticipated construction costs, schedules and completion dates. Risks and uncertainties • • our ability to successfully implement our strategic priorities and whether they will yield the expected benefits • the operating performance of our pipeline and energy assets • amount of capacity sold and rates achieved in our pipeline businesses • the availability and price of energy commodities • the amount of capacity payments and revenues from our energy business • regulatory decisions and outcomes • outcomes of legal proceedings, including arbitration and insurance claims • performance and credit risk of our counterparties • changes in market commodity prices • changes in the political environment • changes in environmental and other laws and regulations • competitive factors in the pipeline and energy sectors • construction and completion of capital projects • costs for labour, equipment and materials • access to capital markets • interest, tax and foreign exchange rates, including the impact of U.S. Tax Reform • weather • cyber security • technological developments • economic conditions in North America as well as globally. You can read more about these factors and others in reports we have filed with Canadian securities regulators and the SEC. Our CDP Climate Change response includes disclosure of risks and opportunities that are not "material" as that term is defined under applicable securities law and guidance. As actual results could vary significantly from the forward-looking information, you should not put undue reliance on forward looking information and should not use future-oriented information or financial outlooks for anything other than their intended purpose. We do not update our forward-looking statements due to new information or future events, unless we are required to by law. FOR MORE INFORMATION. You can also find more information about TransCanada in our annual information form and other disclosure documents, which are available on SEDAR (www.sedar.com).

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Russ Girling, President and Chief Executive Officer (CEO)	Chief Executive Officer (CEO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to
I am submitting my response	Public	Investors

Please confirm below

I have read and accept the applicable Terms