

Welcome to your CDP Climate Change Questionnaire 2019

C0. Introduction

C0.1

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

TC Energy proudly delivers the energy that millions of North Americans rely on to power their lives and fuel industry.

Guided by core values of safety, integrity, responsibility and collaboration, our people are deeply rooted in their communities and ensure we develop and operate our facilities in an economically, socially and environmentally sustainable manner. We are committed to working closely with our neighbours and key stakeholders to develop better project plans and create long-term opportunities and economic benefits in the communities where we operate across Canada, the United States and Mexico.

Our success is achieved in large part by the efforts and actions of more than 7,000 employees and contract professionals who work on our behalf. From our corporate offices to our field operations, we actively seek out a wide range of candidates for all positions; recognizing that diverse backgrounds, cultures, opinions, expertise and skills drive innovation and strengthen our teams.

We have three complementary energy infrastructure businesses.

Natural Gas Pipelines - Our 92,600-kilometre (57,500-mile) portfolio of natural gas pipelines transports more than 25 per cent of the daily North American production of clean-burning natural gas. This pipeline network strategically connects growing supply in the most prolific and lowest cost basins on the continent to key markets across Canada, the U.S. and Mexico. We also operate the continent's largest natural gas storage business, with more than 650 billion cubic feet (Bcf) of regulated and unregulated storage capacity.

Liquids Pipelines - Our 4,900-kilometre (3,000-mile) liquids pipeline system connects growing continental oil supplies to key markets and refineries. The Keystone Pipeline System has long-term contracts to ship 555,000 barrels of crude oil per day (bbl/d) and delivers approximately 20 per cent of



western Canadian production to key refinery markets in the U.S. Midwest and Gulf Coast, where it is converted into gasoline and other petroleum products we use every day.

Power Generation - TC Energy owns or has interests in 11 power generation facilities with capacity of approximately 6,600 megawatts – enough to power more than six million homes. Nearly half of the power we provide is generated from an emission-less nuclear power facility and we are leaders in the development and operation of high-efficiency natural gas-fired and cogeneration power facilities.

For further details about our business, including additional details on the scope, size and strategy of our operations, please refer to our 2018 Annual Report. For more recent information about our business beyond the 2018 timeframe of this report, please review our subsequent quarterly filings. TC Energy is traded on Toronto and New York stock exchanges under the symbol TRP

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
Row 1	January 1, 2018	December 31, 2018	No

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

Midstream

Other divisions

Grid electricity supply from gas

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) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Other, please specify Board of Directors	<p>The Health, Safety, Sustainability and Environment (HSSE) Committee monitors risk management for health, safety, sustainability and environmental risks, including climate-change-related risks and environmental and social issues.</p> <p>The Board and its committees are responsible for risk oversight and the Governance Committee of the Board is responsible for overseeing TC Energy's Enterprise Risk Management (ERM) Framework which provides for management systems and processes for identification, evaluation, prioritization, mitigation, and monitoring of risk.</p> <p>The Audit, Governance and Human Resources committees oversee TC Energy's management of specific types of risk.</p>
Chief Executive Officer (CEO)	<p>The President and CEO is a member of our Board of Directors and is responsible for our overall leadership and vision in developing with our Board our strategic direction, values and business plans. You can find the Terms of Reference for the President and CEO on our website (www.TCEnergy.com/Governance).</p>

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 – all meetings	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding risk management policies</p>	<p>The TC Energy Board of Directors' primary responsibilities are to foster TC Energy's long-term success, oversee our business and affairs and management, and to act honestly, in good faith and in the best interests of TC Energy.</p> <p>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.</p> <p>Climate-related risks are an important consideration in our strategic priorities and this topic has been included in strategic planning sessions with the Board.</p> <p>In late 2018, the Health, Safety and Environment committee was renamed the Health, Safety, Sustainability and Environment (HSSE) Committee, to further reflect Board oversight of climate change-related risks and environmental and social issues, as well as to demonstrate TC Energy's commitment to sustainability. The Board also reviewed management's internal sustainability governance framework, including the role of a Chief Sustainability Officer, development of a management-level sustainability committee and the approach to reporting on climate change-related risks and opportunities.</p> <p>The HSSE committee of TC Energy's Board oversees operational risk, people and process safety, security of personnel, environmental and climate-change-related risks, and monitors development and the implementation of systems, programs and policies related to HSSE matters through regular reporting from management.</p>

		<p>In 2019, management is assessing and implementing consideration of sustainability issues and trends when reporting to the committee. The committee also reviews HSSE performance and operational risk management. It receives detailed reports on:</p> <ul style="list-style-type: none"> • overall HSSE corporate governance, • operational performance and preventive maintenance metrics, • asset integrity programs, • emergency preparedness, incident response and evaluation, • people and process safety performance metrics, • our Environment Program, • developments in and compliance with applicable legislation and regulations, including those related to the environment, • prevention, mitigation and management of risks related to HSSE matters, including climate-change related risks which may adversely impact TC Energy, • sustainability matters, including social, environmental and climate-change related matters, and • management's approach to voluntary public disclosure on HSSE matters. <p>The committee also receives updates on any specific areas of operational and construction risk management review being conducted by management and the results and corrective action plans flowing from internal and third-party audits.</p>
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C1.2

(C1.2) Provide the highest management-level 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, including Chief Sustainability Officer	Both assessing and managing climate-related risks and opportunities	As important matters arise
Other, please specify Internal Health, Safety, Sustainability and Environment Committee	Managing climate-related risks and opportunities	Quarterly
Other, please specify Vice-president, Environment, Land, Indigenous Relations 1	Assessing climate-related risks and opportunities	Quarterly

1VP, Environment, Land and Indigenous Relations

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 (do not include the names of individuals).

In late 2018, we established Board-level governance of sustainability and climate-related issues including sustainability as an area of further responsibility for the Board’s Health, Safety and Environment committee, which was renamed the Health, Safety, Sustainability and Environment Committee (HSSEC). In February 2019, we established the role of the Chief Sustainability Officer (CSO) at the executive leadership level of the organization to drive and manage sustainability throughout the enterprise. The CSO provides the strategic vision and leadership to ensure alignment of sustainability – including our response to climate-related issues – with our corporate strategy.

As well as Board-level governance and the CSO role developments, TC Energy’s corporate HSSEC is an integral part of the governance structure for the company’s Health, Safety and Environment (HSE) Management Programs and Sustainability. In 2019 sustainability was established as a standing agenda item for the HSSEC, which has and continues to consider:

- Climate change-related legislation and policy developments that have the potential to impact our business

- Impacts of climate change-related risks and opportunities, including physical, technological, regulatory, social and other risks
- Development and implementation of a strategic approach to sustainability and climate change-related voluntary public disclosures
- Stakeholder and Indigenous engagement on sustainability issues
- Briefings on initiatives within Operations, Research and Development and Projects that support sustainability

TC Energy's Vice President of Environment, Land and Indigenous Relations (ELIR) sits as a member of the HSSEC and ensures alignment of our overall approach to climate change legislation and policy development. Working with each of the business units (BUs) – Natural Gas Pipelines, Liquids Pipelines and Power and Storage – and other senior leaders across the organization, the VP of ELIR:

- Identifies and assesses climate change-related risks and opportunities to support our BU and corporate risk management processes
- Reviews climate change-related legislation and policy developments at the federal, provincial and state level and assesses the impact to our business
- Advocates for sound climate change-related legislation and policy development to support TC Energy's business and relevant industry association work
- Drives compliance with climate change-related legislation and gathers corporate-level climate change metrics to meet regulatory and voluntary reporting requirements
- Assesses and identifies innovation initiatives for promoting GHG and methane emission reductions

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 (do not include the names of individuals).

Who is entitled to benefit from these incentives?

Other, please specify

Executive Leadership Team and Senior Management

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) in 2018, and these objectives are then cascaded down to senior management in the organization. One KPA was to maximize the full-life value of our infrastructure assets and commercial position. 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, as well as the compensation of their reports who share these objectives.

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	1	2	TC Energy 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 to increase the rigour 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.
Medium-term	3	10	We recognize the future energy system will evolve. As part of our 2018 strategic planning cycle, we analyzed the resilience of our portfolio under three long-term energy scenarios and a fourth alternative case. This scenario analysis formed a key part of our Board of Director’s annual strategic planning session in 2018. For more details on our strategy and scenario analysis, please refer to page 12-15 of our Report on Sustainability and Climate Change. (TCEnergy.com/sustainabilityreport)
Long-term	11	20	Our three major lines of business provide diversification as the energy future unfolds, allowing us to position ourselves in the right asset classes reflecting long-term energy fundamentals. Long-life infrastructure assets and long-term commercial arrangements are the cornerstones of our low-risk business model. Our natural gas and liquids pipeline assets connect low cost supply sources to growing markets – generating predictable and sustainable cash flow and earnings. Long-term power sale agreements are used to manage and optimize our portfolio and to manage price volatility in our power generation business. We track energy supply and demand fundamentals on an ongoing basis. The transition to a lower-carbon energy mix is both a risk and opportunity to our business. Should alternative lower-carbon forms of energy result in decreased demand for our current services, the value of some of our long-lived energy infrastructure assets could be negatively impacted. We are cognizant of such consequences and monitor the development of innovative technologies that have longer-term implications for our strategy.

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	<p>TC Energy carefully assesses risks and opportunities associated with climate change. We incorporate risk assessments into our decision-making process at all levels, listen to our stakeholders' concerns and collaborate with industry peers. Our decisions integrate climate considerations into our overall business strategy.</p> <p>As part of our 2018 strategic planning , we analysed the resilience of our portfolio under three long-term energy scenarios and a fourth alternative case. This formed a key part of our Board of Directors' annual strategic planning.</p> <p>We will continue to use scenario analysis in our strategic planning cycle to enhance the rigour of our assessment of our long-term resilience.</p> <p>Our Enterprise Risk Management program coordinates the identification of emerging risks on a quarterly basis and establishes the top Enterprise Risks on an annual basis. The Chief Risk Officer provides both</p>

			the quarterly emerging risks report and annual enterprise risk report to the Board.
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C2.2b

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

Risk management is integral to the successful operation of our business. Since our inception in 1951, we have managed risks throughout our organization to keep our employees and the communities in which we operate safe and secure as we deliver the energy North Americans need, every day. In early 2018, our management team began a comprehensive review of the risk-management process as part of our commitment to continuous improvement.

A formalized Enterprise Risk Management (ERM) program was approved in late 2018. The ERM program provides a framework and an end-to-end process for risk identification, analysis, evaluation and treatment, with ongoing monitoring and reporting to the Board and Executive Leadership Team. Recognizing many risks are interrelated and should be managed across the enterprise, the ERM program promotes a centralized and pragmatic approach to prioritizing risks, clarifying roles and responsibilities, and improving Board and management oversight. It supports informed decision-making by identifying areas of value capture and value preservation aligned with our strategic and business objectives.

TC Energy’s ERM program governance structure integrates risk management at every level of the organization. The Board and Board Committees have primary, fiduciary responsibility for risk oversight as part of their existing mandate, while the management of risks resides with the Management team. TC Energy’s Corporate Governance Guidelines outline that the Board is responsible for understanding the Enterprise Risks associated with the Company’s business, as well as ensuring Management has implemented appropriate strategies to manage these risks. It is the responsibility of Management to assure the Board and its Committees are kept well informed of these changing risks on a timely basis.

The Chief Risk Officer (CRO) and the Management Risk Committee (MRC) are accountable for managing the Enterprise Risks. The Head of Enterprise Risk is responsible for the ERM Program with support from the ERM Coordinator. Other risk practitioners are consulted and informed on the ERM program through their business and corporate function MRC representatives.

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	<p>We have assets and business interests in several regions subject to GHG emissions regulations, including emission management and carbon pricing policies.</p> <p>Impact: In 2018, we incurred \$62 million of expense under existing carbon pricing programs.</p>
Emerging regulation	Relevant, always included	<p>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 expect that, over time, most of our assets will be subject to some form of regulation to manage GHG emissions.</p> <p>Impact: Changes in regulations may result in higher operating costs or other expenses, or higher capital expenditures to comply with new regulations. Changing environmental requirements or revisions to the current regulatory process may also adversely impact the timing or ability to obtain permit approvals for new energy infrastructure projects.</p> <p>Monitoring and mitigation: We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We support transparent climate change policies that promote sustainable and economically responsible natural resource development.</p>
Technology	Relevant, always included	<p>To be competitive, we must offer energy infrastructure services in supply and demand areas, and for forms of energy that are attractive to customers.</p> <p>Impact: Should alternative lower-carbon forms of energy result in decreased demand for our current services, the value of our long-lived energy infrastructure assets could be negatively impacted.</p> <p>Monitoring and mitigation: We have a diverse portfolio of assets and we utilize portfolio management to divest of non-</p>



		<p>strategic assets. We conduct strategic analyses to identify resilient supply basins as part of our energy fundamentals and strategic development reviews. We also monitor the development of innovative technologies to inform our capital allocation strategy.</p>
Legal	Relevant, always included	<p>We comply with applicable laws and TC Energy is compliant to Canadian and Mexican laws in the corporate Legal Registry including all of those related to GHG emissions, carbon taxes and other climate-related legislation. Legal requirements for the U.S. are managed by each department.</p>
Market	Relevant, always included	<p>We view commodity price and volume risk being the primary market risk related to climate change.</p> <p>Impact: Lower crude oil, natural gas and/or electricity prices could lead producers to curtail their investment in resource development. Reduction in energy supply production could negatively impact opportunities to expand our asset base and, in the longer term, to re-contract with pipeline shippers and power customers as current agreements expire.</p> <p>Monitoring and mitigation: Our business model is based on a long-term, low-risk strategy in which the vast majority of our earnings in all of our business lines are underpinned by regulated cost-of-service arrangements or long-term contracts with creditworthy counterparties. This makes us confident we can continue to deliver on our commitments to our shareholders and stakeholders in an increasingly uncertain and disruptive energy market.</p>
Reputation	Relevant, always included	<p>Our operations and growth prospects require us to have strong relationships with key stakeholders including Indigenous communities, landowners, governments/government agencies, and environmental non-governmental organizations. 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, as well as our access to and cost of capital.</p> <p>Impact: Our reputation with stakeholders, including Indigenous groups, can have a significant impact on our operations and projects, infrastructure development and overall reputation. Should investors develop negative perceptions regarding the energy infrastructure business, future access to investment capital could be negatively impacted.</p> <p>Monitoring and mitigation: 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</p>

		stakeholder programs and policies that set requirements, assess risks and facilitate compliance with legal and policy requirements.
Acute physical	Relevant, always included	<p>Significant changes in temperature and weather 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. Natural disasters and other catastrophic events, including those related to climate change, may lead to business interruption and other adverse impacts.</p> <p>Impact: Physical risks may result in decreased revenues and increased operating costs, legal proceedings, regulatory actions or other expenses all of which could reduce our earnings. Losses not recoverable through tolls or contracts or covered by insurance could have an adverse effect on operations, cash flow and financial position. Certain events could lead to the risk of injury and environmental damage.</p> <p>Monitoring and mitigation: TC Energy’s Operational Management System (TOMS), corporate health, safety, sustainability, environment and asset integrity programs prevent incidents and protect people, the environment and our assets. TOMS includes incident, emergency and crisis management programs to ensure we can effectively respond to operational risk events, minimize loss or injury and enhance our ability to resume operations. This is supported by our business continuity program that identifies critical business processes and develops corresponding business resumption plans. We also have a comprehensive insurance program to mitigate a certain portion of these risks.</p>
Chronic physical	Relevant, always included	<p>All relevant chronic physical risk considerations are included in our response to acute physical risks as highlighted in the question above.</p> <p>Additional to the monitoring and mitigation highlighted in the acute physical risk assessment, 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.</p> <p>We also have a Business Continuity Program that determines critical business processes and develops resumption plans</p>

		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 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	A decrease in demand for refined crude oil products could adversely impact the price that crude oil producers receive for their product. Long-term 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 could 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.

TC Energy carefully assesses the risks and opportunities associated with climate change. To better understand and manage these risks, we:

- incorporate risk assessments in our decision-making process at all levels
- listen to our stakeholders' concerns
- collaborate with our industry peers

Through this iterative process, we make informed decisions that integrate climate considerations into our overall business strategy.

We recognize that everyone – from the Board of Directors to management to employees – has a role to play in risk management. The Board and its committees are responsible for risk oversight and the Governance Committee of the Board is responsible for overseeing TC Energy's Enterprise Risk Management (ERM) Framework which provides for management systems and processes for identification, evaluation, prioritization, mitigation and monitoring of risk. Other Board committees oversee TC Energy's management of specific types of risk. For instance, the HSSE Committee monitor's risk management for health, safety, sustainability and environmental risks, including climate-change-related risks.

The CEO and Executive Leadership Team develops and implements TC Energy's strategy, and the Chief Risk Officer (CRO) is responsible for our Enterprise Risk Management (ERM) Program. The Chief Sustainability Officer (CSO) is responsible for directing the coordination, communication and management of sustainability-related issues for TC Energy, particularly the intersection of risk, governance, environmental and social issues. The CSO reports to the HSSE Committee of the Board as well as to the CEO and Executive Leadership Team on sustainability matters. The Health, Safety, Sustainability, and Environment Management Committee recommends strategic priorities relating to HSSE matters to the CSO, monitors HSSE developments, and shapes communication strategy on HSSE matters. The committee is co-chaired by the CSO and is comprised of management representatives from various departments.

The ERM program provides a pragmatic structure for TC Energy to manage Enterprise Risks in a consistent manner across the enterprise, and it is scalable for Business Units and Corporate Functions. The program establishes the minimum requirements. TC Energy uses bow-tie analysis to identify relevant information related to the risk event to enable an informed assessment of the risk and discussion of effective controls. This approach allows for the development of clearly articulated risk statements, enabling consistent understanding of the potential scenarios that have the potential to occur. In alignment with our risk management standards, practices, and regulations, TC Energy assesses both inherent risk and residual risk when analysing risks. TC Energy analyses risks holistically, seeking to understand the potential consequences of a risk event by examining it through difference lenses. This enables a consistent risk analysis and furthermore informs the response to and treatment of risks.

In parallel TC Energy's Operational Management System has a Risk Management element which involves practitioners involved in the operational risk management processes. The process is underpinned by a standard and a procedure, outlining the governance model and minimum requirements for executing the process from risk identification through to monitoring and reporting.

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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

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

We have assets and business interests in several regions subject to GHG emissions regulations, including emission management and carbon pricing policies. In 2018, we incurred a \$62 million 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 expect, over time, most of our assets will be subject to some form of regulation to manage GHG emissions.

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Changes in regulations may result in higher operating costs or other expenses, or higher capital expenditures to comply with new regulations. Changing environmental requirements or revisions to the current regulatory process may also adversely impact the timing or ability to obtain permit approvals for new energy infrastructure projects. For reference, we incurred a \$63 million expense under existing carbon pricing programs in 2017 and \$62 million in 2018.

Management method

We actively monitor and submit comments to regulators as these new and evolving initiatives are undertaken. We support transparent climate change policies that promote sustainable and economically responsible natural resource development.

Cost of management

Comment

TC Energy recognizes interest from governing bodies to reduce GHG emissions through the implementation of various carbon policy and regulatory mechanisms. We support policies that recognize the global nature of climate change and promote the reduction of both GHG intensity and absolute volume in a way that enhances human well-being now and, in the future, considering the need for affordable, reliable energy and economic growth. You can find more information on our perspective on effective carbon policy on page 19 of our Report on Sustainability and Climate Change.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Technology: Substitution of existing products and services with lower emissions options

Type of financial impact

Reduced demand for products and services

Company- specific description

To be competitive, we must offer energy infrastructure services in supply and demand areas, and for forms of energy that are attractive to customers

Time horizon

Long-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Should alternative lower-carbon forms of energy result in decreased demand for our current services, the value of our long-lived energy infrastructure assets could be negatively impacted.

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

We have a diverse portfolio of assets and we utilize portfolio management to divest of non-strategic assets. We conduct strategic analysis to identify resilient supply basins as part of our energy fundamentals and strategic development reviews. We also monitor the development of innovative technologies to inform our capital allocation strategy.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Market: Uncertainty in market signals

Type of financial impact

Abrupt and unexpected shifts in energy costs

Company- specific description

We view commodity price and volume risk as the primary market risk related to climate change.

Time horizon

Long-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Lower crude oil, natural gas and/or electricity prices could lead to producers curtailing their investment in the development of energy infrastructure. Reduction in energy supply production could negatively impact opportunities to expand our asset base and, in the longer term, to re-contract with pipeline shippers and power customers as current agreements expire.

Management method

Our business model is based on a long-term, low-risk strategy in which the vast majority of our earnings in all of our business lines are underpinned by regulated cost-of-service arrangements or long-term contracts with creditworthy counterparties. This makes us confident that we can continue to deliver on our commitments to our shareholders and stakeholders in an increasingly uncertain and disruptive energy market

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

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

Company- specific description

Our operations and growth prospects require us to have strong relationships with key stakeholders including Indigenous Communities, landowners, governments and government agencies and environmental non-governmental organizations. 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, as well as our access to and cost of capital.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Our reputation with stakeholders, including Indigenous groups, can have a significant impact on our operations and projects, infrastructure development and overall reputation. Should investors develop negative perceptions regarding the energy infrastructure business, future access to investment capital could be negatively impacted.

Management method

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 facilitate compliance with legal and policy requirements.

Cost of management

Comment

Our guiding principles for the environment and engagement with Indigenous groups and landowners ensure we have a consistent and respectful approach to managing our environmental footprint and working with those who have legal rights and distinct relations to their land. For more detail on our guiding principles, please refer to our website (www.tcenergy.com/sustainability)

Identifier

Risk 5

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

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

Company- specific description

Significant changes in temperature and weather have many effects on our business, ranging from the impact on demand, availability and commodity prices, to efficiency and output capability. Extreme temperatures 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. Natural disasters and other catastrophic events, including those related to climate change, may lead to business interruption and other adverse impacts.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Physical risks may result in decreased revenues and increased operating costs, legal proceedings, regulatory actions or other expenses all of which could reduce our earnings. Losses not recoverable through tolls or contracts or covered by insurance could have an adverse effect on operations, cash flow and financial position. Certain events could lead to risk of injury and environmental damage.

Management method

TC Energy's Operational Management System (TOMS), corporate health, safety, sustainability, environment and asset integrity programs prevent incidents and protect people, the environment and our assets. Our pipeline and power generation facilities are designed to withstand severe weather events and significant geophysical disturbance, and we have proven our ability to continue operating safely and reliably in the

midst of hurricanes, wildfires, earthquakes, tornadoes and flooding that has impacted the communities where we operate. TOMS includes incident, emergency and crisis management programs to ensure we can effectively respond to operational risk events, minimize loss or injury and enhance our ability to resume operations. This is supported by our business continuity program that identifies critical business processes and develops corresponding business resumption plans. We also have a comprehensive insurance program to mitigate a certain portion of these risks.

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.

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

Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon

Company-specific description

On November 4, 2016, the Paris Agreement came into force as a global commitment to undertake ambitious efforts to combat climate change and adapt to its effects. Its primary aim is to strengthen the global average increase in temperature below 2°Celsius relative to pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°Celsius. In support of this global commitment, Environment and Climate Change Canada issued the final Methane Reduction Regulation on April 26, 2018. The regulations detail requirements to reduce methane emissions through operational and capital modifications. There are multiple timeframes for compliance, beginning in 2020. For most of TC Energy's Canadian pipeline assets, it is likely that the federal regulation will apply. Compliance will involve equipment retrofits, frequent leak detection, repair surveys and measurements to quantify emission reductions and associated annual reporting. As climate change is a global issue, we support collective actions towards a balanced energy future including investments in new energy infrastructure and advancing innovative and economically effective solutions to reduce GHG emissions. TC Energy supports national and industry commitments leading to global emissions reduction in line with the objective set out the Paris Agreement.

Time horizon

Long-term

Likelihood

More likely than not

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Strategy to realize opportunity

We have experience building and operating renewable, nuclear and natural gas electricity generation facilities and capitalize on that expertise to capture investment opportunities. For example, TC Energy played a significant role in Ontario's transition away from coal-fired power generation through multibillion-dollar investments in nuclear refurbishment, natural gas-fired generation and solar power installations. Electrification investment also complements our natural gas pipeline business, as seen in Mexico. For over a decade, Mexico has significantly transitioned to natural gas from fuel oil and diesel as its primary electricity generation source. The subsequent natural gas demand growth required new pipeline infrastructure. TC Energy has met that need by investing more than \$7 billion (or US\$5 billion) in natural gas pipelines in Mexico.

Cost to realize opportunity

Comment

TC Energy'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

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

Company-specific description

Transporting natural gas – the cleanest-burning fossil fuel – in our pipelines continues to support the significant shift away from coal-fired power generation occurring in North America and beyond. We have a role in developing North America’s liquefied natural gas (LNG) export industry with several pipeline projects in the U.S. and Canada. Our \$6.2-billion Coastal GasLink project in British Columbia will initially move 2.1 Bcf/d of Canadian natural gas to international markets via the LNG Canada liquefaction and export facility. LNG Canada’s exports could reduce annual global carbon dioxide (CO₂) emissions by 60 to 90 million tonnes (LNGCanada.ca) by displacing coal-fired electricity in importing countries, which equates to more than the total annual emissions of British Columbia and roughly 10 percent of Canada’s total annual emissions.

In the U.S., our Columbia Gulf pipeline system supplies the Cameron LNG export terminal in Louisiana with approximately 0.8 Bcf/d and our recently completed WB XPress project supplies gas to the Cove Point LNG facility in Maryland. Combined with our US\$0.4-billion Louisiana XPress and US\$0.2-billion Grand Chenier XPress projects that are under development, we will supply approximately 5 Bcf/d directly to U.S. LNG export markets within the next five years.

Our proposed Keystone XL liquids pipeline project would more than double the capacity of our Keystone Pipeline System with enhanced access to over 4.3 million Bbl/d of refining capacity in Houston and Port Arthur, Texas. Keystone XL would safely deliver Canadian and U.S. crude oil produced under stringent regulatory environments by companies with strong histories of innovation and responsible development, supplanting other internationally-sourced heavy crudes used by Gulf Coast refineries. Electrification investment also complements our natural gas pipeline business, as seen in Mexico.

For over a decade, the country has significantly transitioned to natural gas from fuel oil and diesel as its primary electricity generation source.

The subsequent natural gas demand growth required new pipeline infrastructure. Bringing affordable and reliable natural gas to global partners is not only a financial opportunity, but it helps increase the world's access to cleaner energy sources, reducing global GHG emissions and enhancing global energy security and economic stability.

Time horizon

Medium-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

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

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

Cost to realize opportunity

Comment

TC Energy'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

Energy source

Primary climate-related opportunity driver

Participation in carbon market

Type of financial impact

Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon

Company-specific description

We are committed to managing our GHG emissions, focusing on our GHG intensity and continuing to integrate climate considerations into our overall business strategy, risk management and business development. We look for innovative and economically effective ways to improve system and process efficiencies that help manage emissions. Through the development of world-class technologies, we are working hard to reduce the GHG intensity of our operations and reduce energy use on our pipelines and other facilities. We comply with absolute and intensity-based GHG emission targets based on regulatory requirements in Alberta, Quebec, California and certain states in the U.S. Northeast. In California and Quebec where cap-and-trade programs are in place, we employ a variety of operational and market mechanisms to obtain emission units and offset credits.

Time horizon

Current

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Strategy to realize opportunity

For more than 15 years, TC Energy has proactively managed the emission associated with its core businesses through asset-level efficiency improvements and installations, as well as by taking an industry-leading role in carbon markets across North America. In 2008, TC Energy voluntarily entered a forest carbon management project that is expected to sequester 14,000 tCO₂e on non-farmable land in Saskatchewan between 2009-2029. The project served as a capacity-building opportunity to help prepare TC Energy to take larger and more pronounced steps to offset its emissions in the future. From 2007 through 2017, we were a regulated entity under Alberta's Specified Gas Emitters Regulation, and now the Carbon Competitiveness Incentive Regulation (CCIR). Throughout this period, TC Energy transacted on more than 11 million tonnes of carbon credits in Alberta, with an approximate 4 million tones since 2017. TC Energy has primarily used the purchased credits to meet our

emission reduction obligations in Alberta. We have also sold credits to our existing power and gas customers, as well as to other compliance buyers in the Alberta market

Cost to realize opportunity

Comment

Emission allowances or credits purchased for compliance are recorded on the Consolidated balance sheet at historical cost and expensed when they are utilized or cancelled/retired by government agencies. Compliance costs are expensed when incurred. Allowances granted to or internally generated by TC Energy are not attributed a value for accounting purposes. When required, TC Energy accrues emission liabilities on the Consolidated balance sheet upon the generation or sale of power using the best estimate of the amount required to settle the obligation. Allowances and credits not used for compliance are sold and any gain or loss is recorded in Revenues.

Identifier

Opp4

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of new technologies

Type of financial impact

Returns on investment in low-emission technology

Company-specific description

We believe technological innovation is critical to managing the complex and inter-related issues surrounding GHG emissions. With demand for low-emissions natural gas and electricity steadily climbing, the industry must continuously seek out new technologies to improve system and

process efficiencies and limit the release of emissions. For over half a century, we have pioneered innovative technology and practices to enhance efficiency and reduce emissions at our facilities. For example, in the mid-2000s, TC Energy was the first Canadian company to test prototypes of hand-held, high-flow, leak-detection samplers that were 20 times faster and significantly more accurate than traditional methods. We have been instrumental in distributing this breakthrough technology across the industry.

Time horizon

Long-term

Likelihood

Likely

Magnitude of impact

Unknown

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Strategy to realize opportunity

In early 2019, we launched two first-of-their-kind power generation projects with support from Emissions Reductions Alberta. These projects illustrate how we are realizing new business opportunities that yield economic and environmental benefits: Working in partnership with Siemens, we are developing the world's first waste heat recovery power generation facility that will use supercritical carbon dioxide to capture waste heat



from one of our natural gas pipeline compressor stations, which will be used to generate electricity for Alberta’s power grid. The facility has the potential to generate enough electricity to power more than 10,000 homes, reducing GHG emissions by 44,000 tonnes per year, the equivalent of taking 9,000 vehicles off the road. We are also pursuing a novel, utility-scale solar-plus-storage electricity generation facility near Aldersyde, Alberta. This project will utilize innovative bifacial panel solar technology combined with the deployment of flow battery energy storage technology to demonstrate the practicality of renewable generation and viability of long duration battery storage in Alberta. This innovative project will provide direct GHG benefits through the generation of emission-free renewable power to meet the needs of 3,000 homes. The project will also help prove the technical and commercial viability of these technologies for wide-scale adoption.

Cost to realize opportunity

Comment

C2.5

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

	Impact	Description
Products and services	Impacted	<p>We will continue to adapt to changes in the global and continental energy mix, mitigating risk and capitalizing on opportunities. We have a demonstrated ability to leverage core competencies to respond to a constantly evolving system. Taking advantage of opportunities to diversify, we expanded beyond our traditional natural gas pipeline business into electrification and liquids pipelines.</p> <p>As displacement of coal-fired generation accelerated, we captured natural gas-fired electricity opportunities. In addition, as demand for capacity on the Canadian Mainline declined, we converted part of the system from natural gas to liquids transportation, creating a platform for the Keystone Pipeline. More recently, we adapted to changes in natural gas fundamentals when we shifted our natural gas pipeline strategy, reversing the flow of natural gas on our ANR pipeline and acquiring Columbia Pipeline Group, mitigating threats presented by emerging shale gas production in the Utica and Marcellus formations in the northeast U.S. while creating new opportunities to grow our business. These are only a few of many examples of how TC Energy has thrived in the face of challenges to our business.</p>

<p>Supply chain and/or value chain</p>	<p>Impacted</p>	<p>The energy industry is complex and multi-faceted, comprising of many different activities. TC Energy works as an intermediary in the oil and gas value chain, moving natural gas and crude oil from initial supply sources through our pipelines to markets and/or storage facilities. In addition, we are a supplier of power, generating electricity for companies that distribute energy to homes and businesses.</p> <p>As we seek to expand access to energy while minimizing any negative impacts, we recognize our role in the larger energy system, including the ongoing management of emissions of our own GHGs and the emissions of our industry peers and partners. We believe in a global response to address climate change, where every individual, industry and government must be involved in managing the GHG footprint.</p>
<p>Adaptation and mitigation activities</p>	<p>Impacted</p>	<p>We contribute to a unified North American response to climate change. Our partnerships and collaborations with industry and policy-makers include the following:</p> <ul style="list-style-type: none"> • We are part of a cross-sectoral working group of academics, industry peers and regulatory groups in North America to facilitate regulatory acceptance and industry deployment of new Leak Detection and Quantification (LDAQ) methods and encourage their deployment in more effective Leak Detection and Repair (LDAR) programs. • We sponsored an independent study conducted by the Conference Board of Canada entitled Canadian Economic and Social Implications of Deep GHG Reductions that provided input to the Government of Canada on its commitment to reduce methane emissions in the oil and gas sector. • We are collaborating with several industry peers towards the detection and reduction of methane emissions. For example, we are collaborating with ATCO and Southern Alberta Institute of Technology to develop drone technology for use in detection and quantification of methane emissions. We are also designing a methane capture and destruction/reinjection system for our compressors and methane venting assets in collaboration with Solar Turbines. • We are participating in the U.S. Environmental Protection Agency (EPA) Natural Gas STAR program, a voluntary partnership between EPA and industry to encourage adoption of cost-effective technologies and practices to improve operational efficiency and reduce methane emissions, with a goal of showing methane emissions reductions in existing units with improved efficiency. • We are a participating member company in the Interstate Natural Gas Association of America Methane Emissions Commitment, which was established in 2018 and is a commitment to continuously improve seven specific practices to minimize methane emissions from interstate natural gas transmission and storage operations in a prudent and environmentally

		<p>responsible manner.</p> <ul style="list-style-type: none"> • We are one of 16 members in the ONE Future Coalition, a group of natural gas companies working together to voluntarily reduce methane emissions across the natural gas supply chain. Using uniform, EPA-approved reporting protocols, the coalition registered a 2017 methane intensity number of 0.552%, well ahead of its goal to reach 1% by 2025.
Investment in R&D	Impacted	<p>In 2018, we spent \$1.3 billion for pipeline integrity on the natural gas and liquids pipelines we operate, a \$0.3 billion increase over 2017 in part due to increased capital spending in Canada, increased integrity activities on Columbia assets, and integrity work related to our Keystone U.S. pipeline. Pipeline integrity spending will fluctuate based on the results of annual risk assessments conducted on our pipeline systems and evaluations of information obtained from recent inspections, incidents and maintenance activities.</p> <p>Under the approved regulatory models in Canada, non-capital pipeline integrity expenditures on NEB-regulated pipelines are generally treated on a flow-through basis and, as a result, these expenditures generally have no impact on our earnings. Similarly, under Keystone contracts, pipeline integrity expenditures are recovered through the tolling mechanism and, as a result, generally have no impact on our earnings. Non-capital pipeline integrity expenditures on our U.S. natural gas pipelines are primarily treated as operations and maintenance expenditures.</p> <p>Spending associated with process safety and various integrity programs for the Energy assets we operate is used to minimize risk to employees, the public, equipment, and surrounding environment, and to prevent disruptions to serving the energy needs of our customers.</p> <p>We maintain a robust corporate research and development program, with a focus on improving the safety and efficiency of our operations. For example, we recently implemented new technology in Canada to improve the tracking of our fugitive emissions data at valve sites, meter stations and compressor stations, allowing us to improve operations and regulatory reporting activities to improve our ability to plan maintenance and analyze pipeline data.</p>
Operations	Impacted	<p>Operational risks, including equipment malfunctions and breakdowns, labour disputes, or natural disasters and other catastrophic events, including those related to climate change, acts of terror and sabotage.</p>

		<p>Decreases in revenues and increase in operating costs, legal proceedings or regulator actions or other expenses all of which could reduce our earnings. Losses not recoverable through tolls or contracts or covered by insurance could have an adverse effect on operations, cash flow and financial positions. Certain events could lead to risk of injury and environmental damage.</p> <p>For information on monitoring and mitigation of business interruption risk, please refer to page 85 of our 2018 Annual Report (TCEnergy.com/AnnualReport).</p>
Other, please specify	Impacted	<p>Our operations and growth prospects require us to have strong relationships with key stakeholders including Indigenous communities, landowners, governments and government agencies, and environmental non-governmental organizations. 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, as well as our access to and cost of capital.</p> <p>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 our energy infrastructure business, future access to investment capital could be negatively impacted.</p> <p>For information on monitoring and mitigation of reputation and relationships risk, please refer to page 86 of our 2018 Annual Report (TCEnergy.com/AnnualReport)</p>

C2.6

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

	Relevance	Description
Revenues	Not impacted	Risk management is integral to the successful operation of our business. Our strategy is to ensure that our risks and related exposures are aligned with our business objectives and risk tolerance. We manage risk through a centralized enterprise risk management process that identifies risks that could materially impact the achievement of our strategic objectives. Our Board of Directors' Governance Committee oversees our enterprise risk management activities, which includes ensuring appropriate management systems are in place to identify and manage our risks, including adequate

		<p>Board oversight of our risk management policies, programs and practices. Other Board committees oversee specific types of risk:</p> <ul style="list-style-type: none"> • the Human Resources Committee oversees executive resourcing, organizational capabilities and compensation risk to ensure compensation practices align with our overall business strategy • the Health, Safety, Sustainability and Environment (HSSE) Committee oversees operational, health, safety, sustainability and environmental risk • the Audit Committee oversees management's role in managing financial risk. <p>Our executive leadership team is accountable for developing and implementing risk management plans and actions, and effective risk management is reflected in their compensation.</p>
Operating costs	Impacted	<p>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 2018, we incurred \$62 million (2017 – \$63 million) of expense under existing carbon pricing programs . Business interruption related to operational risks (including equipment malfunctions and breakdowns, labour disputes, or natural disasters and other catastrophic events, including those related to climate change, acts of terror and sabotage) could result in increased operating cost. We have a TC Energy Operational Management System (TOMS) that includes our corporate health, safety, sustainability, environment and asset integrity programs to prevent incidents and protect people, the environment and our assets. TOMS includes incident, emergency and crisis management programs to ensure we can effectively respond to operational risk events, minimize loss or injury and enhance our ability to resume operations. This is supported by our business continuity program that identifies critical business processes and develops corresponding business resumption plans. We also have a comprehensive insurance program to mitigate a certain portion of these risks, but insurance does not cover all events in all circumstances.</p>
Capital expenditures / capital allocation	Not impacted	<p>To be competitive, we must offer energy infrastructure services in supply and demand areas, and for forms of energy that are attractive to customers. Should alternative lower-carbon forms of energy result in decreased demand for our current services, the value of our long-lived energy infrastructure assets could be negatively impacted. We have a diverse portfolio of assets and we utilize portfolio management to divest of non-strategic assets. We conduct analyses to identify</p>



		resilient supply basins as part of our energy fundamentals and strategic development reviews. We also monitor the development of innovative technologies to inform our capital allocation strategy.
Acquisitions and divestments	Not impacted	<p>A key component of our corporate strategy includes cultivating a focused portfolio of high-quality development and investment options. To do that we:</p> <ul style="list-style-type: none"> - assess opportunities to develop and acquire energy infrastructure that complements our existing portfolio and diversifies access to attractive supply and market regions - focus on pipeline and energy growth initiatives in core regions of North America and prudently manage development costs, minimizing capital-at-risk in early stages of projects - will advance selected opportunities to full development and construction when market conditions are appropriate and project risks and returns are acceptable - monitor trends in energy supply and demand, and maintain resilience through diversification, high-quality cash flows and contractually underpinned assets
Access to capital	Not impacted	<p>We are exposed to market risk and counterparty credit risk and have strategies, policies and limits in place to manage the impact of these risks on our earnings, cash flow and, ultimately, shareholder value. Risk management strategies, policies and limits are designed to ensure our risks and related exposures are in line with our business objectives and risk tolerance. Market risk and counterparty credit risk are managed within limits that are established by the Board of Directors, implemented by senior management and monitored by our risk management and internal audit groups. The Board of Directors' Audit Committee oversees how management monitors compliance with market risk and counterparty credit risk management policies and procedures and oversees management's review of the adequacy of the risk management framework. If debt and equity investors reduce or eliminate investment in companies with unmanaged climate-related risks, or if rating agencies downgrade our credit based on unmanaged climate-related risks, this could impact our access to capital. Looking to the recommendations of the Financial Stability Board's Task Force on Climate-Related Financial Disclosures (TCFD), we published a Sustainability and Climate Change report targeted to investors in 2019. The report provides focused, transparent and meaningful disclosure on how we assess and manage the risks and opportunities to our business in relation to climate change, as well as our ongoing actions to reduce greenhouse gas (GHG) emissions from our operations. We also have ongoing engagement with debt and equity investors and ratings agencies to continually improve disclosure on climate-related risk.</p>

Assets	Not impacted	<p>We review long-lived assets, such as plant, property and equipment, equity investments and capital projects in development, for impairment whenever events or changes in circumstances lead us to believe we might not be able to recover an asset's carrying value. Factors we consider in our assessment of the recoverability of long-lived assets include, but are not limited to, macroeconomic conditions, changes in the industries and markets in which we operate, our ability to renew contracts, and the financial performance and prospects of our assets. If the total of the undiscounted future cash flows that we estimate for an asset within Property, plant and equipment, or the estimated selling price of any long-lived asset is less than its carrying value, we consider its fair value to be less than its carrying value and record an impairment loss to recognize this. For goodwill, if the fair value of the reporting unit determined using discounted cash flows is less than its carrying value, we consider it to be impaired.</p>
Liabilities	Not impacted	<p>We maintain an Environment Program to manage environmental risk, compliance and liabilities and minimize potentially adverse environmental impacts.</p> <p>This program identifies our requirements to proactively and systematically manage environmental hazards and risks throughout the lifecycle of our assets. Our primary sources of risk related to the environment include:</p> <ul style="list-style-type: none"> - changing regulations and costs associated with our emissions of air pollutants and GHG - product releases, including crude oil, diluent and natural gas, that may cause harm to the environment (land, water and air) - use, storage and disposal of chemicals and hazardous materials - conformance and compliance with corporate and regulatory policies and requirements as well as new regulations. <p>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. Operating our assets requires obtaining and complying with a wide variety of environmental registrations, licenses, permits and other approvals and requirements.</p> <p>Failure to comply could result in administrative, civil or criminal penalties, remedial requirements, or orders affecting future operations. Through the implementation of our Environment Program, we continually monitor our facilities to ensure compliance with all environmental requirements. We routinely monitor proposed changes in environmental policy, legislation and regulation, and where the risks are uncertain or have the potential to affect our ability to effectively operate our business, we comment on proposals independently or through industry associations. We believe we have</p>

		considered all necessary contingencies and established appropriate reserves for environmental liabilities, however, a risk exists that unforeseen matters may arise requiring us to set aside additional amounts. We adjust reserves regularly to account for changes in liabilities.
Other		

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

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

Our energy infrastructure business is made up of pipeline, storage and power generation assets that gather, transport, produce, store or deliver natural gas, crude oil and other petroleum products and electricity to support businesses and communities in North America. 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 strategy includes commercially developing and building new asset investment programs that balance safety, profitability and social and environmental responsibility in our investing activities. Our strategy also includes monitoring trends in energy supply and demand and maintaining resilience through diversification, high-quality cash flows and contractually underpinned assets. As part of our growth strategy, we rely on our experience and regulatory, commercial, financial, legal and operational expertise to successfully permit, fund, build and integrate new pipeline and other energy facilities. Looking to the recommendations of the Financial Stability Board’s Task Force on Climate-Related Financial Disclosures (TCFD), we assess and manage risks and opportunities to our business in relation to climate change, as well as our ongoing actions to reduce greenhouse gas (GHG) emissions from our operations.

We also track energy supply and demand fundamentals on an ongoing basis. The transition to a lower-carbon energy mix is both a risk and an opportunity for our business. Should alternative lower-carbon forms of energy result in decreased demand for our current services, the value of some of our long-lived energy infrastructure assets could be negatively impacted. We are cognizant of such consequences and monitor the development of innovative technologies that have longer-term implications for our strategy. In 2017, TC Energy committed to invest up to US\$25 million in Energy Impact Partners, a venture capital fund that invests in innovative technologies, services and products throughout the electricity supply chain from generation to consumption. We recognize that the future energy system will evolve. As part of our 2018 strategic planning cycle, we analyzed the resilience of our portfolio under three long-term energy scenarios and a fourth alternative case.

This scenario analysis formed a key part of our Board of Directors’ annual strategic planning session in 2018. Scenarios offer alternative outlooks for the energy future but do not describe what will or should happen, and therefore investors should not rely on them to make investment decisions. We did not assign probabilities to the scenarios. Our objective was to better understand the resilience of our asset portfolio over a large range of potential energy supply and demand outcomes. In this context, resilience refers to our ability to tolerate disruptions and adapt to external changes or uncertainties that may affect our ability to meet our long-term goals and remain effective under most situations and conditions. More detail of our scenario analysis is highlighted in C3.1d.

We will continue to adapt to changes in the global and continental energy mix, mitigating risk and capitalizing on opportunities. We have a demonstrated ability to leverage core competencies to respond to a constantly evolving system. Taking advantage of opportunities to diversify, we expanded beyond our traditional natural gas pipeline business into electrification and liquids pipelines. As displacement of coal-fired generation has accelerated, we terminated our power purchase agreements in Alberta that became unprofitable due to new legislation, and we have captured natural



gas-fired electricity opportunities. In addition, as demand for capacity on the Canadian Mainline declined, we converted part of the system from natural gas to liquids transportation, creating a platform for the Keystone Pipeline. More recently, we adapted to changes in natural gas fundamentals when we shifted our natural gas pipeline strategy, reversing the flow of natural gas on our ANR pipeline and acquiring Columbia Pipeline Group, mitigating threats presented by emerging shale gas production in the Utica and Marcellus formations in the northeast U.S. while creating new opportunities to grow our business. These are only a few of many examples of how TC Energy has thrived in the face of challenges to our business.

Looking forward, we will continue to utilize scenario analysis in our strategic planning cycle to enhance the rigour of our assessment of our long-term resilience. We continually develop mitigation strategies to enhance the resiliency of our business as the energy future evolves. We continue to monitor key indicators or “signposts” to gauge the direction of the energy sector, informing our capital allocation decisions, such as investments and divestitures.

C3.1d

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

Climate-related scenarios	Details
Other, please specify IHS Markit, “Global Scenarios.” https://cdn.ihs.com/www/pdf/0119/IHS-Markit-Global-Scenarios-Brochure.pdf 10 IHS Markit, “Climate and Carbon.” https://cdn.ihs.com/www/pdf/1018/IHSMarkit-Climate-Carbon.pdf	<p>As highlighted in C3.1c, we recognize that the future energy system will evolve. As part of our 2018 strategic planning cycle, we analysed the resilience of our portfolio under three long-term energy scenarios and a fourth alternative case. This scenario analysis formed a key part of our Board of Directors’ annual strategic planning session in 2018.</p> <p>Scenarios offer alternative outlooks for the energy future but do not describe what will or should happen, and therefore investors should not rely on them to make investment decisions. We did not assign probabilities to the scenarios. Our objective was to better understand the resilience of our asset portfolio over a large range of potential energy supply and demand outcomes.</p> <p>In this context, resilience refers to our ability to tolerate disruptions and adapt to</p>

	<p>external changes or uncertainties that may affect our ability to meet our long-term goals and remain effective under most situations and conditions (Task Force on Climate-Related Financial Disclosure (TCFD), Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities”, page 2. https://www.fsb-tcf.org/publications/final-technical-supplement/).</p> <p>We compared our resilience under IHS Markit descriptions of long-term planning and energy scenarios (Rivalry, Vertigo, Autonomy) and complementary alternate case (2°C). Analysis of the scenarios indicated that our base business and foreseeable growth prospects are resilient, largely because North American oil and gas production is expected to remain competitive across all three outlooks. In addition, the regulated and long-term contracted nature of our assets limits exposure.</p> <p>Analysis of the Rivalry, Vertigo and Autonomy scenarios indicated that our base business and foreseeable growth prospects are resilient, largely because North American oil and gas production is expected to remain competitive across all three outlooks. In addition, the long-term contracted nature of our assets limits exposure. Energy fundamentals in the IHS Markit scenario, Rivalry, support growth in our core business segments. The Vertigo scenario foresees a more volatile political and economic future with constrained clean energy policy and technology development. However, TC Energy’s portfolio is resilient due to sustained energy demand and continued fossil fuel dominance of the energy mix. Investment opportunities exist in our core businesses and our ability and preference to fund growth from internally-generated cash flow insulates us from economic volatility. TC Energy’s portfolio withstands threats posed by the accelerated transition to less carbon-intensive energy sources and increased country-level energy independence that defines the Autonomy scenario.</p>
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	<p>Abundant low-cost energy coupled with efficiency gains leads to intense competition amongst energy sources and fossil fuel supplies. TC Energy's resilience requires being competitively positioned in North America's lowest-cost basins.</p> <p>In the 2°Celsius scenario, decreases in long-term fossil fuel demand due to energy efficiency gains and technological breakthroughs in electrification and energy storage introduces uncertainty about the long-term resilience of traditional energy markets and the subsequent implications for energy infrastructure companies. TC Energy's assets in the 2°Celsius scenario are largely insulated from fossil fuel demand destruction to 2030, with only modest exposure for our liquids and natural gas pipeline assets. Post-2030 is an inflection point for hydrocarbons as policy aspirations materially reduce demand for fossil fuels. In such a situation we can adopt measures to preserve value such as accelerating depreciation or abandonment surcharges in order to ensure a return of capital.</p>
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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

Targeted % reduction from base year

20

Base year

2010

Start year

2013

Base year emissions covered by target (metric tons CO₂e)

118,352

Target year

2020

Is this a science-based target?

% of target achieved

Target status

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. TC Energy's Canadian Mainline natural gas pipeline facilities in Québec are also covered under this program. Accordingly, we meet the regulatory targets through a combination of emissions reduction and emissions management within the cap and trade framework.

Target reference number

Abs 2

Scope

Scope 1

% emissions in Scope

Targeted % 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?

% of target achieved

Target status

Please explain

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

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

31.7

Targeted % reduction from base year

20

Metric

Metric tons CO2e per unit of production

Base year

2015

Start year

2018

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

0.03785

Target year

Is this a science-based target?

% of target achieved

Target status

Underway

Please explain



Under the Carbon Competitiveness Incentive Regulation (CCIR) in Alberta, established industrial facilities with GHG emissions above a certain threshold must reduce their emissions below a facility-specific benchmark. The CCIR program covers our natural gas pipelines in the province. The base year is an average of 2015-2017 annual emissions intensities.

% change anticipated in absolute Scope 1+2 emissions

% change anticipated in absolute Scope 3 emissions

Target reference number

Int 2

Scope

Scope 1

% emissions in Scope

13.3

Targeted % reduction from base year

Metric

Metric tons CO₂e per unit of production

Base year

2015

Start year

2018

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

0.37

Target year

Is this a science-based target?

% of target achieved

Target status

Underway

Please explain

Under the Carbon Competitiveness Incentive Regulation (CCIR) in Alberta, established industrial facilities with GHG emissions above a certain threshold must reduce their emissions below benchmark. The CCIR program covers our energy assets in the province. The benchmark is specific to the product (i.e. electricity output)

% change anticipated in absolute Scope 1+2 emissions

% change anticipated in absolute Scope 3 emissions

0

Target reference number

Int 3

Scope

Scope 1

% emissions in Scope

13.3

Targeted % reduction from base year

Metric

Metric tons CO₂e per unit of production

GJ/tCO₂e

Base year

2015

Start year

2018

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

0.06299

Target year

Is this a science-based target?

% of target achieved

Target status

Underway

Please explain

Under the Carbon Competitiveness Incentive Regulation (CCIR) in Alberta, established industrial facilities with GHG emissions above a certain threshold must reduce their emissions below benchmark. The CCIR program covers our energy assets in the province. The benchmark is specific to the product (i.e. industrial heat output)

% change anticipated in absolute Scope 1+2 emissions

% change anticipated in absolute Scope 3 emissions

C4.2

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

C-OG4.2a

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

TC Energy has been an early adopter in the implementation and control of methane emissions by implementing a comprehensive Leak Detection and Repair (LDAR) program throughout our operations. This program meets or exceeds all existing regulatory requirements, regardless of jurisdiction where we operate. The LDAR program has resulted in continued reductions in methane emissions.

Methane emission reductions are expected to continue with the recent Canadian Federal and Provincial methane reduction regulations due to take effect January 1, 2020. These regulations mandate the frequency for testing, specifically for compressor venting and fugitive emissions, and prescribe vent limits and timelines to repair identified leaks.

In addition, TC Energy is a signatory to the United Nations (UN) Methane Guiding Principles. These principles focus on priority areas for action towards the reduction of methane emissions across the natural gas value chain. In alignment with these principles, we continue to implement practices



to enhance our management of fugitive methane emissions. During maintenance, the use of pull-down compressors and hot tap procedures help us to capture and recycle methane emissions. During operation, our Fugitive Emissions Inspection and Leak Repair Program enables us to identify leaks on pipeline and compressor station valves and other components, helping reduce releases of natural gas. We are investing in new technology in our operations 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 activities.

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 initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation		
To be implemented*	1	44,000
Implementation commenced*		
Implemented*	6	891,975
Not to be implemented		

C4.3b

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

Initiative type

Process emissions reductions

Description of initiative

Other, please specify

Estimated annual CO₂e savings (metric tonnes CO₂e)

891,975

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

2,557,758

Investment required (unit currency – as specified in C0.4)

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, TC Energy 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. TC Energy 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 natural gas spot price in 2018 via Alberta Energy Regulator: Commodity Prices: Natural Gas Prices. Note that this is an assumption given TC Energy’s extensive pipeline operations.

Initiative type

Fugitive emissions reductions

Description of initiative

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 C0.4)

Investment required (unit currency – as specified in C0.4)

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: TC Energy's Fugitive Emissions Inspection and Leak Repair program involves identifying leaks on pipeline and compressor station components (such as valves), setting priorities and conducting repairs, helping reduce releases of natural gas.

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

<1 year

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. Hot Tapping avoids product loss, methane emissions, and disruption of service to customers. TC Energy 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, TC Energy is able to reduce methane loss and costs to our shippers.

Initiative type

Fugitive emissions reductions

Description of initiative

Estimated annual CO₂e savings (metric tonnes CO₂e)

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Tracking Fugitive Emissions Data

Stage of Development: Implemented

Description: TC Energy tracks Canadian Gas Operations fugitive emissions data at our pipeline valve sites, meter stations and compressor stations, allowing us to improve operations and regulatory reporting activities to improve our ability to plan maintenance and analyse pipeline data.

Initiative type

Energy efficiency: Processes

Description of initiative

Heat recovery

Estimated annual CO2e savings (metric tonnes CO2e)

44,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Waste heat recovery power generation

Stage of Development: To be implemented

Description: In early 2019, TC Energy launched two first-of-their-kind power generation projects with support from Emissions Reduction Alberta. Working in partnership with Siemens, we are developing the world's first waste heat recovery power generation facility that will use supercritical carbon dioxide to capture waste heat from one of our natural gas pipeline compressor stations, which will be used to generate electricity for Alberta's power grid. The facility has the potential to generate enough electricity to power more than 10,000 homes, reducing GHG emissions by 44,000 tonnes per year.

Initiative type

Process emissions reductions

Description of initiative

Estimated annual CO2e savings (metric tonnes CO2e)

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: US Environmental Protection Agency (EPA) Natural Gas STAR Program

Stage of Development: Implemented

Description: TC Energy is participating in the US EPA Natural Gas STAR program, a voluntary partnership between EPA and industry to encourage adoption of cost-effective technologies and practices to improve operational efficiency and reduce methane emissions, with a goal of showing methane emissions reductions in existing units with improved efficiency.

Initiative type

Process emissions reductions

Description of initiative

Estimated annual CO2e savings (metric tonnes CO2e)

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Ongoing

Comment

Nature of Activity: Interstate Natural Gas Association of America Methane Emission Commitment

Stage of Development: Implemented

Description: TC Energy is a participating member company in the Interstate Natural Gas Association of America Methane Emission

Commitment, which was established in 2018 and is a commitment to continuously improve seven specific practices to minimize methane emissions from interstate natural gas transmission and storage operations in a prudent and environmental responsible manner in three areas of operation: pipelines and pneumatic controllers; storage and compressor stations; and, R&D and information.

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 several regions where there are regulations to address industrial GHG emissions, including GHG pricing policies which include emissions trading schemes.

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

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

Comment

Through our Power operations, we provide lower-carbon energy. Nearly half of the power we provide is generated from an emission-less nuclear power facility and we are leaders in the development and operation of high-efficiency natural gas-fired and cogeneration power facilities.

C-EU4.6

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

In alignment with our commitment as a signatory to the United Nations (UN) Methane Guiding Principles, we are committed to managing our GHG emissions, focusing on our GHG intensity and continuing to integrate climate considerations into our overall business strategy, risk management and business development. We look for innovative and economically effective solutions to improve system and process efficiencies that help manage emissions.

Through the development of world-class technologies, we are working hard to reduce the GHG intensity of our operations and reduce energy use on our pipelines and other facilities. We comply with absolute and intensity-based GHG emissions targets based on regulatory requirements in Alberta, Québec, California and certain states in the U.S. Northeast. In California and Québec where cap-and-trade programs are in place, we employ a variety of operational and market mechanisms to obtain emission units and offset credits.

For over half a century, we have pioneered innovative technology and practices to enhance efficiency and reduce emissions at our facilities. For example, in the mid-2000s, TC Energy was the first Canadian company to test prototypes of hand-held, high-flow, leak-detection samplers that were 20 times faster and significantly more accurate than traditional methods. We have been instrumental in distributing this breakthrough technology across industry. We maintain a robust corporate research and development program, with a focus on improving the safety and efficiency of our operations. For

example, we recently implemented new technology in Canada to improve the tracking of our fugitive emissions data at valve sites, meter stations and compressor stations, allowing us to improve operations and regulatory reporting activities to improve our ability to plan maintenance and analyse pipeline data.

We also continue to implement practices to enhance our management of fugitive methane emissions from our power generation activities. For example, our 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.

C-OG4.6

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

TC Energy continues to be a driving force in the pipeline industry in developing and implementing new practices and technologies to reduce fugitive emissions and the loss of natural gas and associated methane during routine operations and maintenance. TC Energy is a signatory to the United Nations (UN) Methane Guiding Principles. These principles focus on priority areas for action towards the reduction of methane emissions across the natural gas value chain. As a signatory to the UN Methane Guiding Principles, we strive to:

- Continually reduce methane emissions
- Advance strong performance on methane emissions reductions across the natural gas value chain
- Improve the accuracy of methane emissions data collection
- Advocate sound policy and regulations on methane emissions
- Increase transparency in relevant reporting on methane emissions

In alignment with these principles, TC Energy continues to implement practices to enhance our management of fugitive methane emissions. For example, during maintenance, the use of pull-down compressors and hot tap procedures help us to capture and recycle methane emissions. During operation, TC Energy's Fugitive Emissions Inspection and Leak Repair Program enables the identification of leaks on pipeline and compressor station valves and other components, helping reduce releases of natural gas. TC Energy continues to invest in new technology to improve tracking of natural gas pipeline fugitive emissions data at valve sites, meter stations and compressor stations. The technology improves operations and regulatory reporting activities while reducing overall methane emissions.

While we don't own or operate any upstream oil and gas production assets, as a further example of our efforts to reduce methane emissions, 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. 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.

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?

Yes

C-OG4.7a

(C-OG4.7a) Describe the protocol through which methane leak detection and repair or other leak detection methods, are conducted for oil and gas production activities, including predominant frequency of inspections, estimates of assets covered, and methodologies employed.

TC Energy does not own or operate any upstream oil and gas production assets; however, we have proactively undertaken LDAR for years. As well regulatory rules require leak tests at selected compressor stations in the following jurisdictions:

- Alberta – Alberta Energy Regulator Directive 060
- British Columbia - Greenhouse Gas Industrial Reporting and Control Act: Greenhouse Gas Emission Reporting Regulation
- Ontario - Environmental Protection Act: O. Reg. 452/09: Greenhouse Gas Emissions Reporting,
- Quebec - Regulation Respecting Mandatory Reporting of Certain Emissions of Contaminants into the Atmosphere:
- US Federal: 40 CFR Part 98 Greenhouse Gas Reporting Rule Subpart W (M12) and 40 CFR Part 60 Oil and Natural Gas Emission Standards for New, Reconstructed and Modified Sources (M3).

For example, in Canada, TC Energy has been completing LDAR surveys at the compressor station on an annual basis and meter stations every three years. Going forward, these LDAR frequencies will increase to three times a year for both the compressor and the meter stations starting in 2020 as per the Canadian federal and provincial methane regulation requirements.

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.

While TC Energy does not own or operate any upstream oil and gas production assets, we use flares at the gas storage operations at a minimal capacity for process safety purposes. Where practical and safe, flaring is also used as part of the Canada gas operations to combust the methane releases from pipeline blowdowns during maintenance activities. We also operate a limited number of flares at liquids terminals. In these instances, we capture vent gas from oil storage tanks and loading activities and flare this captured gas to minimize the impact to the environment by destroying potentially harmful compounds and reducing overall GHG emissions through combustion.

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)

13,100,000

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)

190,000

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

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

☞ GREET 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.

TC Energy calculates its GHG emissions using a combination of methods required by various regulations in the 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 use of 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 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?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

13,445,443

Start date

January 1, 2018

End date

December 31, 2018

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

TC Energy does not report Scope 2 emissions using market-based figures.

C6.3

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

Reporting year

Scope 2, location-based

467,943

Start date

January 1, 2018

End date

December 31, 2018

Comment

Scope 2 electricity generation emission factors based on provincial grid factors as reported by Environment Canada and USEPA eGRID factors based on subregion

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

Relevance of Scope 1 emissions from this source

Relevance of location-based Scope 2 emissions from this source

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

Explain why this source is excluded

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

Explanation

TC Energy has evaluated all Scope 3 emission source categories based on the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (version 1.0) Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. This standard recommends that companies identify which activities are expected to have the most significant GHG emissions, emissions reduction opportunities and are most relevant to the company's business goals. Based on this standard's Table II criteria, TC Energy considers GHG emission reduction activities in areas where we have direct control.

Capital goods

Evaluation status

Not relevant, explanation provided

Explanation

TC Energy has evaluated all Scope 3 emission source categories based on the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (version 1.0) Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. This standard recommends that companies identify which activities are expected to have the most significant GHG emissions, emissions reduction opportunities and are most relevant to the company's business goals. Based on this standard's Table II criteria, TC Energy considers GHG emission reduction activities in areas where we have direct control.

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

Evaluation status

Relevant, calculated

Metric tonnes CO2e

2,589,641

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 considers all relevance criteria, including size, influence, risk, stakeholders, outsourcing, sector guidance and spending or revenue analysis. Currently, it represents approximately 99% of Scope 3 Emissions Results.

Upstream transportation and distribution

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

7,136

Emissions calculation methodology

Inputs: The primary inputs for calculating emissions from Upstream Transportation and Distribution are (1) Distance travelled in kilometres by Canadian and US fleet; (2) Fleet leased percentage in Canada and the US; (3) Distance travelled in kilometres 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

TC Energy has evaluated all Scope 3 emission source categories based on the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (version 1.0) Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. This standard recommends that companies identify which activities are expected to have the most significant GHG emissions, emissions reduction opportunities and are most relevant to the company's business goals. Based on this standard's Table II criteria, TC Energy considers GHG emission reduction activities in areas where we have direct control.

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Explanation

TC Energy has evaluated all Scope 3 emission source categories based on the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (version 1.0) Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. This standard recommends that companies identify which activities are expected to have the most significant GHG emissions, emissions reduction opportunities and are most relevant to the company's business goals. Based on this standard's Table II criteria, TC Energy considers GHG emission reduction activities in areas where we have direct control.

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

6,273

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

TC Energy has evaluated all Scope 3 emission source categories based on the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (version 1.0) Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. This standard recommends that companies identify which activities are expected to have the most significant GHG emissions, emissions reduction opportunities and are most relevant to the company's business goals. Based on this standard's Table II criteria, TC Energy considers GHG emission reduction activities in areas where we have direct control.

Employee commuting

Evaluation status

Not relevant, explanation provided

Explanation

TC Energy has evaluated all Scope 3 emission source categories based on the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (version 1.0) Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. Table II Criteria for identifying relevant Scope 3 activities which provides a description of activities associated with different criteria has been used.

TC Energy has implemented our Extensity program which captures the mileage associated with employee commuting and this data is used to calculate our Scope 3 emissions.

Upstream leased assets

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

13,767

Emissions calculation methodology

Inputs: The primary inputs for calculating emissions from Upstream Leased Assets are (1) TC Energy 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

TC Energy has evaluated all Scope 3 emission source categories based on the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (version 1.0) Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. Table II Criteria for identifying relevant Scope 3 activities which provides a description of activities associated with different criteria has been used.

We continue to report emissions associated with upstream leased assets.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

The emission source category does not apply to TC Energy. In the energy business line, TC Energy 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, TC Energy has Transportation Service Agreements which allows TC Energy 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 TC Energy Scope 1 and 2 emissions inventories.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Explanation

The emission source category does not apply to TC Energy. We do not provide intermediate products for further processing. Electricity is produced to be sold to end-users. As a midstream company, we transport natural gas and oil but do not own or sell these products.

Use of sold products

Evaluation status

Not relevant, explanation provided

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 TC Energy. We recognize that emissions from end use of natural gas drive the natural gas supply chain (cradle-to-gate) emissions estimates. Our GHG Inventory is focused on the assessment of emission sources where the organization can control emission reduction activities. On a supply chain basis, the emissions from electricity and natural gas end use are outside TC Energy's control and accordingly are excluded.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Explanation

The emission source category does not apply to TC Energy as we are a midstream company. We are an energy infrastructure organization that transports oil and natural gas and we don't control the use or end-of-life treatment of the energy we transport.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

This emission source category does not apply to TC Energy as we are a midstream company.

Franchises

Evaluation status

Not relevant, explanation provided

Explanation

This emission source category does not apply to TC Energy as we are a midstream company.

Investments

Evaluation status

Relevant, calculated

Metric tonnes CO2e

Emissions calculation methodology

Relevant, but not separately calculated

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



Explanation

As part of the TC Energy capital management process, a review of GHG emissions is included in the project development stage and the impact is evaluated as part of the internal and external project approval process.

Other (upstream)

Evaluation status

Explanation

Other (downstream)

Evaluation status

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

271

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

3,620,755

Metric denominator

Other, please specify
Billion cubic feet (Bcf)

Metric denominator: Unit total

13,382

Scope 2 figure used

Location-based

% change from previous year

2.7

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 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 2.7% increases in intensity from 2017 to 2018 was not significant.

Intensity figure

898

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

7,159,204

Metric denominator

Other, please specify

Billion cubic feet (Bcf)

Metric denominator: Unit total

7,973

Scope 2 figure used

Location-based

% change from previous year

10.3

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 Canada and represents Scope 1+2 emissions only from those facilities. The 10.3% increase in intensity from 2017 to 2018 was associated with a change in utilization of the Canadian pipeline system.

Intensity figure

229

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

55,870

Metric denominator

Other, please specify
Billion cubic feet (Bcf)

Metric denominator: Unit total

244

Scope 2 figure used

Location-based

% change from previous year

34.4

Direction of change

Increased

Reason for change

Metric tonnes CO₂e per natural gas throughput (Bcf). The 34.4% increase in intensity from 2017 to 2018 is due to a change in operating conditions of our Mexican Tamazunchale TGNH & TGNH – EXT lines. As well, the source data used in 2018 is more comprehensive than that provided in 2017.

Intensity figure

0.1

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

3,027,258

Metric denominator

megawatt hour generated (MWh)

Metric denominator: Unit total

29,228,685

Scope 2 figure used

Location-based

% change from previous year

18.6

Direction of change

Increased

Reason for change

Metric tonnes CO₂e per MWh produced is relevant to our Energy assets and measures Scope 1+2 emissions only from those facilities. The 18.6% increase in INTENSITY from 2017 to 2018 was due to the divestiture of Ontario Solar, Kibby Wind and TC Hydro which have a very low emissions intensity. Accordingly, the increase in emissions intensity is due to the divestiture of renewable electricity generation while maintaining the higher emissions intensity assets.

Note that many of TC Energy'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

3

Direction of change

Decreased

Reason for change

3% (rounded from 2.8%) decrease is a non-significant change.

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 2018.

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

Midstream

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

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

0.007

Comment

Methane emissions are 0.0073% of total natural gas and hydrocarbon throughput

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

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 CO2, CH4, N2O	13,445,443	Other, please specify Other, please specify • 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)

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	18	0	539	
Combustion (Electric utilities)	2,968,417	362	0	3,000,603	23.3% reduction in 2018 versus 2017 due to divestiture of Ocean State Power, Ravenswood and Ironwood.
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.

Emissions category

Fugitives

Value chain

Midstream

Product

Gas

Gross Scope 1 CO2 emissions (metric tons CO2)

428

Gross Scope 1 methane emissions (metric tons CH4)

15,949

Total gross Scope 1 emissions (metric tons CO2e)

399,154

Comment

Transport/transmission, storage of gas

Emissions category

Combustion (excluding flaring)

Value chain

Midstream

Product

Gas

Gross Scope 1 CO2 emissions (metric tons CO2)

9,373,203

Gross Scope 1 methane emissions (metric tons CH4)

1,369

Total gross Scope 1 emissions (metric tons CO2e)

9,452,352

Comment

Overall increase of 22.8% in 2018 versus 2017 primarily due to increased utilization of the Canadian pipeline system.

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	9,908,527
United States of America	3,460,173
Mexico	76,743

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	10,380,794
Liquids Pipelines	0
Energy	3,014,349
Transportation Fuel	50,299

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	Comment
Electric utility generation activities	3,014,349	Includes emissions from cogeneration, simple cycle power and gas storage in Canada.
Oil and gas production activities (upstream)		
Oil and gas production activities (downstream)	10,380,794	Includes emissions from pipeline activities in Canada, the United States and Mexico. Also includes gas storage in the US.

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	204,593		707,040	
United States of America	261,056		456,587	
Mexico	2,294		2,294	

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	429,679	
Liquids	25,355	
Energy	12,908	

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
Oil and gas production activities (upstream)			
Oil and gas production activities (downstream)	467,943		Overall increase in emissions of 26.5% in 2018 compared to 2017 based on improved data accuracy relative to previous years from our CPG/US Gas Operations East operations.

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?

Increased

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	0	No change		
Other emissions reduction activities	0	No change		
Divestment	0	No change		
Acquisitions	0	No change		
Mergers	0	No change		
Change in output	0	No change		
Change in methodology	0	No change		
Change in boundary	0	No change		
Change in physical operating conditions	243,035	Increased	10	The scope 1 emissions decreased due to lower fuel consumption; however, scope 2 energy consumption increased to a greater extent so that there is a net positive increase in emissions
Unidentified	0	No change		
Other	0	No change		

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?

Don't know

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)		63,406,491	
Consumption of purchased or acquired electricity			881,568	
Consumption of self-generated non-fuel renewable energy				
Total energy consumption			64,288,059	

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 heat	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)

Natural Gas



Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

63,406,491

MWh fuel consumed for self-generation of electricity

16,333,947

MWh fuel consumed for self-generation of heat

MWh fuel consumed for self-generation of steam

MWh fuel consumed for self-cogeneration or self-trigeneration

11,516,462

Comment

C8.2d

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

Natural Gas

Emission factor

Unit

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	29,228,685	18,007	0	
Heat	7,782,826			
Steam				
Cooling				

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)

6,437

Gross electricity generation (GWh)

5,856

Net electricity generation (GWh)

5,820

Absolute scope 1 emissions (metric tons CO₂e)

2,995,012

Scope 1 emissions intensity (metric tons CO₂e per GWh)

511

Comment

Nameplate capacity and gross electricity generation have been adjusted for 50% Portlands Energy Centre ownership. In addition, Scope 1 emission intensity has incorporated steam output from our cogeneration facilities in Alberta and Quebec. Electricity generation was decreased by 30% from 2017 to 2018 due to divestiture of Ironwood, Ravenswood and Ocean State assets.

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)

3,099

Gross electricity generation (GWh)

23,373

Net electricity generation (GWh)

23,097

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 have been adjusted for 48.4% TC Energy ownership. Decreased in electricity generation by 4% in 2018 versus 2017 but changes are not significant.

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)

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

Wind

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

Solar

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 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)

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

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.

C-EU8.4

(C-EU8.4) Does your electric utility organization have a 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

2.2

Metric numerator

Million cubic metres

Metric denominator (intensity metric only)

% change from previous year

50.7

Direction of change

Decreased

Please explain

Decrease (4.5 million cubic metres in previous year 2017)

TC Energy recognizes water and water systems as a fundamental component of the ecosystems where we operate. We use water during the hydrostatic testing of the integrity of our pipelines and we utilize water as a coolant and essential component of the power generation process at our power facilities. For this water metric, TC Energy 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.

In many instances, the water used in hydrostatic testing of pipelines is returned at equal or higher quality to the same watershed, but because this water is not returned to the exact point-source of extraction as per the DJSI definition, it is considered consumed. The hydrostatic testing water consumption dataset includes only hydrostatic testing of Canadian pipelines. The total volume of water for hydrostatic testing of Canadian pipelines decreased by 75% as there were 40% less hydrostatic tests required in 2018 and accounts for 4% of the total Canadian water consumption in this dataset.

At our power facilities, the water is withdrawn from surface water, groundwater and municipal water utilities and used in the power generation

process. The water consumption does not meet the DJSI criteria of discharged to the source higher or equal quality because this water is not returned to the exact point-source of extraction as per the DJSI definition. The total power water consumption is inclusive of the following Canadian power assets: Redwater Cogeneration Plant, Bear Creek Cogeneration Plant, Carseland Cogeneration Plant, Halton Hills Generating Station, Beacancour Cogeneration Plant and Napanee Generating Station. These Canadian power assets water consumption accounts for 96% of total water consumed in Canada. The U.S power asset water consumption is only from Coolidge Generating Station, accounting for 4% of the total overall power assets water consumption.

The decrease in in water consumption in 2018 is largely due to the sale of the U.S. power assets (Ocean State, Ravenswood and Ironwood) in June 2017. These assets accounted for 51% of the water consumption in 2017, and thus has is reflected for the large decrease in total water consumption in 2018 of 50.7%.

Description

Waste

Metric value

235,198

Metric numerator

Metric tonnes

Metric denominator (intensity metric only)

% change from previous year

49

Direction of change

Increased

Please explain



TC Energy is committed to proper management of waste materials to protect human health and the environment. TC Energy employs a comprehensive waste management process across all business areas and jurisdictions, which is integral to and concords with TC Energy's Environment Program and is in compliance with regulatory requirements. The 2018 dataset includes operations, project, and remediation waste for these operated assets – Columbia Gas Transmission (wholly-owned [WO]); ANR Pipeline (WO); PNGTS (61.71%); Bison Pipeline (WO); Tuscarora Gas Transmission System (26.8% effective ownership [EO]); North Baja Pipeline (26.8% EO); GTN (26.8% EO); Great Lakes Transmission (66.6% EO); Northern Border Pipeline (13.4% EO); Keystone Pipeline (US) (WO); Crossfield Gas Storage (WO); Edson Gas Storage (WO); Grand Rapids Pipeline System (50% EO); and Northern Courier Pipeline System (WO). The 2018 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. It includes hazardous and non-hazardous waste and both solids and liquids.

In 2017, waste disposed reported as 230,423 metric tonnes. In review a data conversion error was discovered. The 2017 data is corrected and updated to 158,024 metric tonnes waste disposed.

2018, 235,198 metric tonnes of waste were disposed. The 49% increase in this waste dataset was inclusion of Keystone Pipeline (US). This (US) data was not reflected in the 2017 dataset and accounts for 40% of the waste in the 2018 dataset. The addition of Keystone Pipeline (US) reflected such a large increase as 99.9% of that waste was from final remediation efforts associated with the oil leak incident that occurred on the Keystone Pipeline system near Amherst, South Dakota in November 2017. Also, AER regulated oil tank terminals and oil pipelines assets in Alberta, Canada became fully operational in 2018, accounting for an increase in waste, although these facilities account for less than 1% of the total waste in this dataset.

Waste is managed in compliance with regulatory requirements and TC Energy best management practices. We strive to continuously improve how we collect waste data and our methodology for reporting, so some data is not included in this dataset as we improve our data collection.

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
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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
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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, 2018

Investment end date

December 31, 2018

Investment area

R&D

Technology area

Other, please specify

☞ 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

Applied research and development

Investment figure

5,400,000

Low-carbon investment percentage

41-60%

Please explain

TC Energy has a long-time commitment to reduced emissions and improved efficiency. For over half a century we have tested promising new technologies to minimize fugitive emissions and reduce emissions and fuel consumption of our pipeline compressors. We have played a key role in advancements related to reducing the environmental footprint not only of our own activities, but across the industry. A complete list of R&D organizations we fund is available at TCEnergy.com/safety

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)	
Scope 3	

C10.1a

(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

Page/ section reference

Alberta, BC, Ontario, Quebec and California have extensive verification requirements under their respective GHG reporting programs. Emissions reported for those provinces have been 3rd-party verified. The Mexican regulation only requires verification of a 3rd party when the system exceeds 25,000 tonnes CO₂e/annual methane emissions. In 2018 only one system exceeded this amount; others did not. All GHG emissions are assured by the internal processes and reported to various regulatory agencies.

Relevant standard

Proportion of reported emissions verified (%)

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?

No, we do not verify any other climate-related information reported in our CDP disclosure

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

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

Period end date

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Comment

California CaT

% of Scope 1 emissions covered by the ETS

Period start date

Period end date

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Comment

Ontario CaT

% of Scope 1 emissions covered by the ETS

Period start date

Period end date

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Comment

Québec CaT

% of Scope 1 emissions covered by the ETS

Period start date

Period end date

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Comment

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, 2018

Period end date

December 31, 2018

% of emissions covered by tax

100

Total cost of tax paid

Comment

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 Carbon Competitiveness Incentive Regulation (CCIR) in Alberta were exempted from the carbon tax in order to avoid double taxation.

BC carbon tax

Period start date

January 1, 2018

Period end date

December 31, 2018

% of emissions covered by tax

100

Total cost of tax paid

Comment

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?

TC Energy owns assets and have business interests in a number of regions subject to GHG emissions regulations, including GHG emissions management and carbon pricing policies. In 2018, we incurred \$62 million (2017 – \$63 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 promote sustainable and economically responsible natural resource development. 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.

Environment and Climate Change Canada (ECCC) issued the final Methane Reduction Regulation on April 26, 2018. The regulations detail requirements to reduce methane emissions through operational and capital modifications. There are multiple timeframes for compliance depending on the provision, beginning in 2020. For most of TC Energy's Canadian pipeline assets, it is likely that the federal regulation will be applicable. Compliance

will involve equipment retrofits, frequent leak detection and repair surveys and measurements to quantify emission reductions and associated annual reporting.

In 2018 the Government of Canada has published a Federal plan to have carbon pricing in place in all Canadian jurisdictions as of January 1, 2019. On June 28th, 2019 ECCC has published the final Federal OBPS regulation, imposing carbon pricing for larger industrial facilities based on product benchmarks for GHG emissions for various industry sectors. This new federal regulation applies to the provinces of Ontario, Manitoba, Saskatchewan, and New Brunswick as those jurisdictions do not currently have a provincial plan in place for carbon pricing or meet the criteria of the Federal plan

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 Carbon Competitiveness Incentive Regulation – Offset System

Number of credits (metric tonnes CO2e)

16,235

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

16,235

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)

TC Energy 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.

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

80

Variance of price(s) used

In determining internal carbon price, we use scenario analysis with variations over time, geographies and policy outcomes. Our currency varies over geographies – for example, TC Energy is subject to different provincial, regional and state-level carbon pricing in North America. TC Energy has an internal, multi-disciplinary team that continuously refines the Company's strategy for managing climate change risks and opportunities, including carbon price forecasts.

Type of internal carbon price

Shadow price

Impact & implication

TC Energy 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

Collect climate change and carbon information at least annually from suppliers

% of suppliers by number

% total procurement spend (direct and indirect)

% Scope 3 emissions as reported in C6.5

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

Details of engagement

% of customers by number

0

% Scope 3 emissions as reported in C6.5

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, TC Energy 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, TC Energy's Report on Sustainability and Climate Change is a public document for all of our stakeholders to view online.

Impact of engagement, including measures of success

Impact of engagement and success is determined long-term as TC Energy 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 Carbon Pricing Policies 1	Support with minor exceptions	Engaged with multiple levels of government regarding federal and provincial carbon taxes. TC Energy provides technical information to help inform the development of benchmarks.	Carbon pricing has a role to play in the transition to a lower carbon-emissions energy system. We support sensible and cohesive public policy frameworks. We encourage consistent implementation between different levels of government and between provinces for improved efficiency. TC Energy has highlighted the need for clear rules and a stable framework to give the market clearly-defined, predictable and transparent pricing signals over the long term. TC Energy encourages government to promote technological innovation to reduce emissions and provides additional solutions for government to consider.

<p>Other, please specify Diversifying the energy mix</p>	<p>Support with minor exceptions</p>	<p>In collaboration with industry members and associations, TC Energy provided comments to government on the proposed Clean Fuel Standard.</p>	<p>TC Energy encourages policy makers to ensure policy supports innovation and development and implementation of new technologies. We continue to highlight the need to consider Canadian competitiveness and policy which recognizes the transportation role that pipelines serve in the energy lifecycle.</p>
<p>Regulation of methane emissions</p>	<p>Support with minor exceptions</p>	<p>TC Energy has been involved with multiple levels of government to better understand the implementation of this regulation.</p>	<p>Recognizing the relatively low emissions from pipeline operations, it is important that government policy in this area appropriately balances the cost and burden on the industry of regulations designed to reduce emissions with limited ability to affect further meaningful reductions.</p>
<p>Regulation of methane emissions</p>	<p>Support with minor exceptions</p>	<p>TC Energy and industry peers met with the U.S. Environmental Protection Agency to discuss policy development related to reducing methane emissions for equipment at natural gas transmission compressor stations and storage.</p>	<p>We believe a unified North American response to climate change and air quality issues will ensure competitiveness. It must be maintained or enhanced while working toward solutions to manage GHG and air emissions. TC Energy supports responsible government policies that manage GHG emissions while balancing other North American priorities, including social and economic wellbeing. TC Energy advocates for policies across North America that recognize the role that natural gas can play in mitigating GHG emissions</p>

¹Pan-Canadian Framework on Clean Growth and Climate Change

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. 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 (economic, environmental, and energy) bottom line; and, be harmonized across jurisdictions within Canada, to an extent that is reasonable and practical.

How have you influenced, or are you attempting to influence their position?

TC Energy is an active participant in the development of public policy positions, sharing our expertise and experience using technology and contributing to research and development to reduce emissions.

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. INGAA is 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.

How have you influenced, or are you attempting to influence their position?

TC Energy is an active participant in the development of public policy positions, sharing our expertise and experience using technology and contributing to research and development to reduce emissions. 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 support methane reduction.

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.

How have you influenced, or are you attempting to influence their position?

TC Energy is an active participant in the development of public policy positions, sharing our expertise and experience using technology and contributing to research and development to reduce emissions

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 influenced, or are you attempting to influence their position?

TC Energy is an active participant in the development of public policy positions, sharing our expertise and experience using technology and contributing to research and development to reduce emissions.

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. IETA's objective is to build international policy and market frameworks for reducing greenhouse gases at lowest cost.

How have you influenced, or are you attempting to influence their position?

TC Energy is an active participant in the development of public policy positions, sharing our expertise and experience using technology and contributing to research and development to reduce emissions.

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.

TC Energy 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.

TC Energy is a signatory to the United Nations (UN) Methane Guiding Principles. These principles focus on priority areas for action towards the reduction of methane emissions across the natural gas value chain. As a signatory to the UN Methane Guiding Principles we strive to:

- Continually reduce methane emissions
- Improve the accuracy of methane emissions data collection

- Advocate sound policy and regulations on methane emissions
- Increase transparency in relevant reporting on methane emissions

In alignment with these principles, we continue to implement practices to enhance our management of fugitive methane emissions.

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?

In maintaining consistency with our overall climate strategy, TC Energy relies on an internal team to continuously refine the Company's activities that may influence climate policy. This group provides input from their experience and expertise to inform policy response strategies and ensure consistency. The team includes members of corporate groups (e.g. environment (governance and operational services), government relations, industry relations, legal, and regulatory services); representatives from business segments (e.g. commercial teams); and elicits feedback from external stakeholders (e.g. professional peers, industry associations, non-governmental organizations). The viewpoint of all stakeholders is utilized in response to policy developments in order to establish an understanding of policy and implications and to identify potential response strategies. Policy positions are reviewed, in an effort to ensure consistent engagement.

The risks associated with climate policy are monitored and escalated to Senior Management through TC Energy's enterprise risk management process to ensure leadership has visibility on the broader perspective, and that treatments are applied in a holistic and consistent manner. As carbon policy plays a role in the volume and makeup of future energy demand, this information is also used to inform scenario analysis that looks to assess the impact to the business of various energy scenarios. This work is iterative, in that the outcome of this scenario analysis in-turn helps highlight where and how TC Energy should be looking to shape energy policy.

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 voluntary sustainability report

Status

Complete

Attach the document

 tc-sustainability-and-climate-change.pdf

Page/Section reference

whole book

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures

Comment




Publication

In mainstream reports, incorporating the TCFD recommendations

Status

Complete

Attach the document

-  transcanada-2018-annual-information-form.pdf
-  transcanada-2019-management-information-circular.pdf
-  tc-annual-report.pdf

Page/Section reference

Annual Report, Management Information Circular, Annual Information Form

Content elements

- Governance
- Strategy
- Risks & opportunities
- Other metrics
- Other, please specify

Comment

Publication

In voluntary sustainability report

Status

Underway – previous year attached

Attach the document

-  2017datasheet.pdf

Page/Section reference

Content elements

Comment

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.

All data cited within this submission reflects 2018 numbers. Where relevant, 2019 developments are reflected in the discussion and analysis.

This survey response contains certain information that is forward-looking and is subject to important risks and uncertainties (such statements are usually accompanied by words such as "anticipate", "expect", "believe", "may", "will", "should", "estimate", "intend" or other similar words). Forward-looking statements in this document are intended to provide TC Energy security holders and potential investors with information regarding TC Energy and its subsidiaries, including management's assessment of TC Energy's and its subsidiaries' future plans and financial outlook. All forward-looking statements reflect TC Energy's beliefs and assumptions based on information available at the time the statements were made and as such are not guarantees of future performance. 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 information due to new information or future events, unless we are required to by law. For additional information on the assumptions made, and the risks and uncertainties which could cause actual results to differ from the anticipated results, refer to our latest Quarterly Report to Shareholders at TCEnergy.com/Investors and the 2018 Annual Report at TCEnergy.com/AnnualReport or filed under TC Energy's profile on SEDAR at www.sedar.com and with the U.S. Securities and Exchange Commission at www.sec.gov.



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		

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