



Energy Transition and Climate Change

At Enbridge, we recognize that climate change is a global issue. As a leading energy infrastructure company—with assets positioned across the energy system—we are uniquely positioned to help society transition to a lower-carbon economy, and we're working to reduce our own emissions at the same time.



Our energy transition approach is based on emissions reduction, greater energy efficiency and investing in lower-carbon energy solutions.

Business Context and our Strategic Response

Responding to climate change and supporting the transition to a lower emissions economy are important areas of focus for our business—and our stakeholders.

We see two serious challenges facing the world today: the need to meet a growing demand for energy, driven by global population growth and economic development; and the need to address climate change by keeping average global temperatures from rising 2°C above pre-industrial levels. We believe that the world must be diligent in finding new ways to meet this dual challenge, and that the answer lies in finding and pursuing multiple pathways to provide affordable and reliable energy while protecting our environment. We are convinced that innovation can and should happen across the entire energy system: that is, more renewable energy and cleaner oil and gas. Global energy systems are already being reshaped, providing significant opportunity for forward-looking companies.

Close scrutiny of energy supply and demand fundamentals has enabled us to become one of North America's largest and most successful energy infrastructure companies—delivering oil, natural gas, NGLs and renewable energy. We have made big investments in natural gas infrastructure and continue to see significant opportunity in offshore

wind projects. Our business strategy has evolved to reflect these shifting market fundamentals. We're applying and encouraging clean technology and innovation across energy systems—including accelerated strategies for less carbon-intensive oil and natural gas; energy efficiency; fuel-switching; and electrification generated from low emissions and renewable sources, including wind, solar and hydrogen produced through Power-To-Gas (P2G).

Our Approach

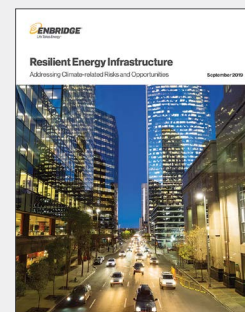
Our approach to supporting the transition to a low carbon economy is guided by our Climate Policy and involves three key focus areas:

- Reducing GHG emissions from our own operations.
- Helping customers reduce their energy use and GHG impact.
- Investing in renewable energy assets and low-carbon solutions.

As a leading energy infrastructure company, Enbridge recognizes that we have a responsibility to address climate change. We also recognize that—as a company with assets positioned across the entire energy system—we are uniquely positioned to help bridge the transition to lower carbon economy. Each of our core business units has a role to

Enhanced Climate-Related Disclosure

In September 2019 we released a Climate Report entitled *Resilient Energy Infrastructure—Addressing Climate-Related Risks and Opportunities*. In this report, we address recommendations made by the TCFD and expand our reporting on governance, risk management and opportunities, and strategic decisions with respect to climate change. In preparing the report we tested the resilience of our strategy and existing assets against two separate International Energy Agency scenarios. The process itself has and will continue to be highly valuable and a key part of our strategic thinking. In the final analysis, we see strong utilization of our existing assets through 2040 and significant opportunity for growth within each of our businesses.



play in reducing our own operational GHG emissions profile while we work with others to reduce GHG emissions across the entire energy value chain. We have also demonstrated our ability to advance energy diversification while ensuring the safety and reliability of energy supply.

In order to address climate change, we commit to taking climate actions that are consistent with our business model; align with changing energy market fundamentals; and address government and stakeholder expectations for meaningful progress on emissions reduction and management of climate risks.

We are currently developing next-generation targets for our Scope 1 and Scope 2 operational GHG emissions following our achievement of initial Scope 1 targets, and to reflect the breadth and scope of our business after our 2017 acquisition of Spectra Energy. We consider climate-related risks and impacts in our business decision-making:

- Our Enterprise Asset Management group applies a carbon sensitivity analysis when reviewing asset decisions.
- Our Investment Review team is in the process of integrating carbon sensitivity analysis into the capital investment approval process.

Our Enterprise Asset Management Group evaluates assets and investments by identifying and assessing financial benefits from energy efficiency measures in the form of annual power savings and reduced GHG emissions, and considers avoided GHG emissions in the context of environmental benefits and potential financial gains and losses. Our Investment Review team considers the potential compliance obligations associated with a potential project's energy consumption, including both electricity and natural gas. Carbon compliance costs are assessed at a national level, while electricity consumption is considered at a provincial/state level.

Our Performance

Reducing GHG Emissions in our Operations

We recognize that for us to play a key role in the transition to a lower emission economy and support the achievement of national and global emission reduction goals, we must take a proactive approach to reducing our own carbon footprint. That approach includes a focus on reducing the carbon intensity of our operations through enhanced energy efficiency and a commitment to continuously improve the way we manage methane emissions from our facilities. One of our main areas of focus is to reduce emissions from our ongoing operations and future projects.

“Enbridge operates in numerous jurisdictions across North America and is therefore subject to an array of climate-related regulations, including both implicit (i.e. methane regulation) and explicit (i.e. carbon tax) carbon pricing frameworks. In some instances it makes sense for Enbridge to engage directly with regulators given our unique circumstances as a company operating across international boundaries. However, in most cases we collaborate with other midstream companies through industry associations and non-governmental organizations.”

Edwin Makkinga, Manager, Climate Policy



Liquids Pipelines system optimization

LP implements a variety of techniques to optimize its operations, reduce power consumption and reduce indirect GHGs emissions across its network of oil pipelines. These include:

- Allocating larger volumes of crude oil to our more energy efficient pipelines and ensuring that oil is balanced across both heavy and light crude lines.
- Similar to fuel efficiency for an automobile, operating a pipeline at consistent flow rate (“speed”) a practice that leads to more energy efficient operation and less overall power (or “fuel”) consumption.
- The use of Drag Reducing Agent, a product that is injected into crude oil to reduce pipeline fluid friction, allowing oil to flow more efficiently and allowing for certain pump stations to be bypassed, thus reducing total energy consumption.
- Introducing power limits on certain stations to avoid unnecessary spikes on the flow rates.

Offices and buildings

GDS is deploying a five-year plan to reduce GHG emissions within our Ontario properties. In 2018, GDS achieved reduced GHG emissions at its Victoria Park Centre location by 11% and realized a 9% reduction at its Technology and Operations Centre in Markham through energy conservation measures. Work continues in 2019, including another targeted LEED Gold renovation project.

Vehicles

GDS has the largest natural gas vehicle fleet in Canada. To date, 41% of the fleet has been converted to operate on Compressed Natural Gas (CNG). In 2018, GDS invested more than \$5.5 million in CNG in both internal and external projects. These investments will further support an overall reduction in Scope 1 GHG emissions from fleet operations.

Managing our energy consumption

Pipeline transportation of crude oil and natural gas accounts for most of our energy consumption. GTM and GDS consume mainly natural gas, while LP's operations primarily rely on electricity to drive pump motors. The increase in energy consumption between 2016 and 2018 reflects the acquisition of Spectra Energy in 2017, which grew our gas transmission and distribution assets significantly and brought relative balance to our portfolio of oil and natural gas assets within both GTM and GDS asset portfolios.

Capturing waste heat

NRGreen Power LP is an independent power producer co-owned by Alliance Pipeline (of which Enbridge is co-owner with Pembina Pipeline Corporation). The company captures waste heat generated by natural gas-fired compressors and converts that to electricity without creating additional GHG emissions. Recovered energy is sold back to the electric grid within host provinces, and resulting carbon offset credits are sold into provincial carbon emissions compliance markets.

Enbridge's methane emissions

Methane emissions primarily result from natural gas that has either been vented to the atmosphere as part of normal operating procedures, or from fugitive emissions, which are small leaks or releases of gases or vapors from pressurized equipment or components.

Enbridge has undertaken many initiatives to manage and reduce methane emissions. Integrity management practices are in place for all of Enbridge's natural gas transmission and distribution pipelines and related storage and operational facilities. These assets are systematically maintained through testing, inspections and auditing. In addition to preventative maintenance, leak detection surveys are regularly conducted at our facilities using a variety of technologies and tools, including Optical Gas Imaging cameras, hand-held 'sniffer' gas detectors, right-of-way surveillance and air patrols on transmission lines and the use of infrared cameras.

In the U.S., GTM participates in the Environmental Protection Agency's (EPA) Natural Gas STAR Program, which provides a framework for the implementation of methane-reducing technologies and practices and documentation of voluntary emission reduction activities. In 2018, Enbridge reported avoided methane emissions of 3.1 million cubic feet¹ through the implementation of the following initiatives:

- Use of pipeline pump-down techniques to lower gas line pressure.
- Use of composite wrap repair.
- Use of hot taps for in-service pipeline connections.
- Use of YALE² closures for Emergency Shut Down (ESD) testing.

GTM also adheres to the Interstate Natural Gas Association of America's Methane Emissions Commitments aimed at continuously improving transmission and storage operations in a prudent and environmentally responsible manner. In 2018 the volume of methane emissions increased by approximately 22% from our GTM business segment as a result of acquisitions and divestitures, operational changes including new pipelines coming into service, and an outage on a flare on one of our major pipelines (resulting in increased venting). Our LP operations are not a major source of methane emissions.

Methane* (tCO₂e)

	2016 [†]	2017	2018
GTM	349,000	1,553,000	1,891,000
GDS	309,000	507,000	503,000
Total	658,000	2,061,000	2,394,000

*A GWP of 25 has been used to estimate methane emissions in t CO₂e.

[†]Legacy Enbridge data only.

¹The avoided methane emissions volume reported by GTM to the EPA Natural Gas STAR program does not include the Alliance and Vector pipelines.

²A YALE closure is a screwed-on pipe cap with a built in needle valve that bleeds the gas pressure off the ESD valve stake for safely removing the YALE device.

SPOTLIGHT :

Reducing operational GHG emissions at GDS

GDS tracks GHG emission reduction opportunities through its Facility GHG Emission Reduction Program. These opportunities include:

- **Avoiding vented gas for new builds:** When completing maintenance activities at compressor sites, sometimes it's necessary to vent natural gas from the equipment and surrounding pipelines to make them safe. Instead of releasing this natural gas (methane) to the atmosphere, we review new site designs with our Environment group to determine where opportunities to reduce methane emissions are apparent. As budgets allow, we introduce GHG emission-limiting facilities into the design. During the past year, four transmission stations along the GDS system have been equipped with blowdown recovery compressors that can be used during maintenance activities.
- **Electric valve operators for new builds:** Unlike pneumatic valves, electric valve operators do not vent natural gas into the atmosphere. For new builds, we evaluate the usage of electric valve operators as the preferred option for non-critical configuration valves.
- **Online monitoring for storage and transmission operations:** GDS operates a transmission system that moves natural gas from the Dawn Storage Hub to customers across Ontario. The online monitoring project will connect the main transmission stations to optimize engine use, resulting in reduced fuel consumption and reduced environmental impact. This project is still in the pilot phase.

Helping Customers Improve Their Energy Use and GHG Impact

Through a wide range of Demand Side Management (DSM) programs, we encourage our natural gas customers—from homeowners to industrial facilities—to adopt energy-saving equipment and operating practices to reduce energy consumption. Our DSM programs consist of energy-savings equipment and operating practices such as:

- Energy-efficiency audits of residential homes, commercial and industrial facilities.
- Financial rebates.
- Sharing of technical expertise.
- Support to industry and trade associations in various sectors (schools, hotels and motels, construction, automotive, food and beverage, pulp and paper, etc.) to promote DSM programs and enhance industry standards and best practices.
- Design pre-construction charrettes (planning sessions) that support and educate builders on higher-energy-efficiency building options.
- Partnerships with governments, suppliers and equipment manufacturers on investments in new energy-efficient technologies that benefit ratepayers.

As part of its DSM portfolio, the Savings by Design program (serving legacy EGD rate zone) and the Commercial Savings by Design green-building program (serving legacy Union Gas rate zone) help builders construct energy-efficient, healthy and sustainable homes that exceed the 2017 Ontario Building Code requirements by at least 15%.

The programs bring together a range of subject-matter experts and financial incentives during the design, construction and commissioning stages of building and housing projects. In 2017, the energy efficiency programs offered by our utility were recognized with awards from the Ontario Energy Association, the Ontario Sustainable Energy Association and EnerQuality, which recognizes energy-efficient home building.

Between 1995 and 2017³, GDS's energy efficiency programs saved our customers 25 billion cubic meters of natural gas, which is enough to serve nearly 11 million homes⁴ for one year. These natural gas savings have resulted in a reduction of 47.3M tonnes of Carbon Dioxide Equivalent (tCO₂e), roughly equal to removing 9.3 million⁵ cars from the road for one year.

Investing in Renewable Energy and Lower-Carbon Solutions

We are diversifying our assets to reflect a changing global energy mix and are now one of Canada's largest renewable energy companies. Since 2002, we have invested more than \$7.8 billion in renewable energy projects and our net interests have capacity to generate about 1,750 MW of zero-emission energy. In most cases, our onshore renewable energy and transmission projects are underpinned by attractive long-term power purchase agreements (PPAs) and price hedge arrangements that deliver stable cash flows and attractive returns similar to those realized by our liquids and gas transportation businesses.

³ 2016 and 2017 spending and results are unaudited and subject to change.

⁴ Assumes a residential customer uses a range between 2,200 to 2,400m³ per year to heat their home and water.

⁵ Assuming the average automobile produces 5.1 tonnes of CO₂e per year.

SPOTLIGHT :

GDS home retrofit offerings

In 2018, GDS provided enhanced home audit and retrofit program offerings, delivered in partnership with the Government of Ontario and Independent Electricity System Operator (IESO). The offerings provided rebates for completing a home energy audit and upgrades within the home, such as installing an energy efficient heating system, water heater, insulation, windows and air sealing.

GDS was able to provide residential homeowners with a coordinated, one-stop-shop approach to identifying energy efficiency improvements for qualifying measures and accessing rebates for their home. The offerings assisted homeowners in improving the efficiency of their homes, reducing their energy bills and reducing GHG emissions.

The Government of Ontario target for the enhanced home retrofit offering over the 2016 to 2019 period was 36,000 home retrofit participants. GDS has surpassed this target. The final participants of the enhanced home retrofit offering are being processed in 2019 as the enhanced offering winds down.

Wind Energy Investments

Enbridge has an interest in 20 offshore and onshore wind projects either in operation or under construction. We see great potential in offshore wind—one of the fastest-growing energy segments in Europe, where there is a significant push for a greater component of renewables in the supply mix and limited space for onshore renewable development. Since 2015 Enbridge has committed \$2.5 billion in offshore wind energy investments in Europe:

- **German Offshore Wind Development:** Enbridge is partnering with Germany's EnBW on the 497-MW Hohe See and 112-MW Albatros wind farms in the North Sea. Both are expected to enter service in 2019.
- **Rampion Offshore Wind Project:** Enbridge holds a 24.9% interest in the Rampion Offshore Wind Project, which entered commercial operation in November of 2018. The project, located off the United Kingdom's Sussex coast, consists of 116 turbines and has a generating capacity of 400 MW—enough electricity to supply almost 350,000 homes a year.
- **Dunkirk Offshore Wind Project:** In June 2019 France's Ministry for Ecological and Inclusive Transition selected the EDF Group, in partnership with Innogy and Enbridge, to design, build, operate and maintain the future Dunkirk offshore wind farm. The project, located 10 km off the coast of Dunkirk, will have an installed capacity of almost 600 MW. The wind farm should come into service in 2025.
- **Saint-Nazaire Offshore Wind Project:** In August 2019 Enbridge announced it is moving forward on the first of four offshore wind farms under development in France with its partner EDF Renouvelables. Enbridge has a \$1.8-billion gross investment in the 480-MW Saint-Nazaire offshore wind project, underpinned by a fixed PPA. The project is located off the northwest French coast.

Enbridge plans to continue to develop our power and renewables business where we have a competitive advantage and where we find opportunities with strong commercial underpinnings. As opportunities emerge, we will look to manage financial, regulatory and construction risk while securing long-term power purchase agreements.

Natural gas: Bridging the transition

Clean-burning natural gas has a critical role to play in the transition to a lower emissions economy. As one of North America's largest distributors and transporters of natural gas, we are well positioned to be a leading supplier of affordable and reliable natural gas to provide fuel for power generation, industrial and manufacturing facilities, and residential and commercial heating. Natural gas complements renewables by providing a quick-start backup while renewable-related issues such as intermittency, availability and volume and energy storage are resolved.

Over the next few decades the power generation and transmission network in North America is expected to undergo significant growth. With over 3.75 million natural gas customers and an extensive natural gas storage and distribution network, we believe our natural gas utility is well-positioned to help advance lower-emissions energy solutions that can enable access between zero emission and low-carbon sources of energy and existing natural gas assets, to support continued consumer access to reliable, low-cost energy in the future.

In 2018, the CPPIB acquired a 49% interest in select renewable energy assets in North America. Additionally, we entered into a joint venture agreement with CPPIB to pursue future European offshore wind projects. The combination of Enbridge's operating and development capability with CPPIB's resources and experience creates a powerful Canadian champion for developing offshore renewable energy projects in Europe.

Our asset mix will continue to be informed by the global energy mix—as renewable demand increases, our investments in renewable energy will likely increase as well.

SPOTLIGHT :

Spotlight: GDS's approach to greening natural gas

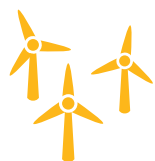
To further support the transition to a low-carbon future, we're working to vertically integrate our platforms for renewable energy and natural gas. We are expanding engagement in renewable natural gas (RNG)—energy produced from the decomposition of organic waste.

We're also pursuing power-to-gas (P2G) technology, and in partnership with the Canadian technology firm Hydrogenics we've developed North America's first utility-scale P2G pilot facility. GDS has invested more than \$1.6 million in P2G technology, which converts electricity into hydrogen and can be stored for future use.

The integration of renewable fuel supplies like RNG and hydrogen into existing pipeline distribution systems for natural gas could contribute significantly to meeting GHG emission reduction targets by reducing the carbon content of natural gas used to heat homes and buildings and for transportation. In partnership with the city of Toronto, Enbridge will add approximately 3.2 million cubic meters of RNG annually to distribution pipelines beginning year-end 2019, helping reduce the carbon intensity of the natural gas we deliver to our customers. To date GDS has invested about \$5 million in RNG.

Renewable Energy Net Generation Capacity

Enbridge's renewable energy projects—either operating or under construction—have the capacity to generate about 1,750 MW net of zero-emission energy.



20 wind farms
1,647 MW



4 solar energy operations
78 MW



1 geothermal project
9 MW



5 waste heat recovery facilities
17 MW



1 hydroelectric facility
0.5 MW

All megawatt figures are net capacity.

Scope 1 GHG Emissions

Scope 1 GHG emissions include those that result directly from our operations such as natural gas combustion from compressors used for transmission, along with fugitive and vented emissions. In 2018, our company-wide Scope 1 GHG emissions were about the same (slightly less) as they were in 2017. The change in total Scope 1 GHG emissions between 2016 and 2018 reflects the 2017 acquisition of Spectra Energy and its extensive natural gas transmission, storage and distribution infrastructure within both GTM's and GDS's asset portfolio.

Scope 2 GHG Emissions

Scope 2 GHG emissions include those that result from the off-site generation of electricity, which we buy and consume. LP uses electricity to operate the pumps that push crude oil and other liquid hydrocarbon products through its pipelines. Note that as our pipelines become fuller, the amount of energy needed to push crude oil and other liquid hydrocarbon products increases proportionately due to several factors, including the type of flow and liquid viscosity. In 2018, the amount of electricity use increased by nearly 8% because the volume of the product we delivered also increased.

Scope 1 (Direct) and Scope 2 (Indirect) GHG Emissions (tCO₂e)

	2016 ¹	2017	2018
Scope 1	2,445,000	10,214,000	10,680,000
Scope 2	5,225,000	6,436,000	6,795,000

Energy Consumption (Gigajoules)

	2016 ¹	2017	2018
Fuel	30,736,000	127,938,000	122,567,000
Electricity	31,399,000	41,820,000 ²	44,518,000
Total Energy	62,135,000	169,758,000	167,085,000

¹ Legacy Enbridge data only.

² 2017 electricity consumption data for legacy Enbridge's U.S. based GTM assets has been assumed equal to 2016.

Scope 3 GHG Emissions

We track Scope 3 GHG emissions that result from our utility customers' natural gas use, from our employee business air travel and from electricity grid transmission and distribution loss. An increase in total Scope 3 GHG emissions between 2016 and 2018 reflects the addition of approximately 1.5 million natural gas customers through Enbridge's acquisition of Union Gas in 2017. Natural gas complements renewable energy by providing a quick-start backup while renewable-related issues such as intermittency, availability, volume and energy storage are resolved.

Detailed GHG emissions and energy consumption data, broken out by business unit, is available in the appendix to this report, beginning on Page 85.

Scope 3 GHG Emissions (tCO ₂ e)			
	2016	2017	2018
Transmission and distribution loss^{1,2}			
Canada	186,000	212,000	240,000
U.S.	126,000	165,000	165,000
Total	312,000	377,000	405,000
Our customers' natural gas consumption			
GDS	21,500,000	46,500,000	49,600,000
Employee air travel for business			
Total	4,300	7,100 ¹	7,200 ³

¹ GHG Emissions that result from Grid Loss: We provide a high-level estimate of the Scope 3 GHG emissions resulting from the loss of electricity during its transmission and distribution.

² The estimate assumes the 2017 (Canada) and 2016 (U.S.) national-level percentage grid losses apply for all years. Sources: ECCC NIR (2019) and EPA eGRID (2018).

³ The 2016 emissions for employee air travel are for legacy Enbridge only, while 2017 and 2018 data represents combined company operations.