



# ENVIRONMENTAL STEWARDSHIP

Beyond working to minimize our environmental footprint and the impact associated with our operations, we look for opportunities to improve the environmental performance of our customers and the communities we are privileged to serve.

## ENVIRONMENTAL STEWARDSHIP AT A GLANCE



CLIMATE CHANGE & ENERGY USE



ENVIRONMENTAL MANAGEMENT



CO<sub>2</sub>e/year avoided through building efficiency initiatives from our Jandakot Operations Centre in Western Australia



35MW

hydroelectric generating facility acquired in Veracruz, Mexico

37%

or 6.3 million tonnes reduction in direct GHG emissions, and more than 36% reduction in air emissions of nitrogen oxides and sulphur dioxides compared to 2008

10%

increase of in-line inspections on gas transmission lines year-over-year. Our goal is to inspect all transmission lines more than eight inches in diameter and five kilometres in length by 2024.

33%

reduction in vented and fugitive methane emissions from our Canadian natural gas transmission, distribution and storage networks since 2008



# ENVIRONMENTAL STEWARDSHIP

## CLIMATE CHANGE & ENERGY USE

To reduce both the direct and indirect GHG emissions associated with our operations, we are exploring new and more efficient ways to generate, transport and conserve energy. From diversifying our electricity generation portfolio to minimizing impacts associated with our buildings, we are working collaboratively with governments, customers, communities, industry, and our Indigenous partners to help enable a low-carbon future.

### Reducing Our Direct Impacts

The transition to a lower-emitting energy system will require a large-scale renewal of capital infrastructure. With pipelines, transmission lines and power stations built to operate for several decades, this transition requires careful long-term planning and balanced consideration of impacts to customers, communities, investors and the environment. That's why we are identifying near-term opportunities to reduce emissions while providing reliable, affordable energy to the customers we serve - whether through investing in new low-carbon projects or retrofitting our existing facilities.

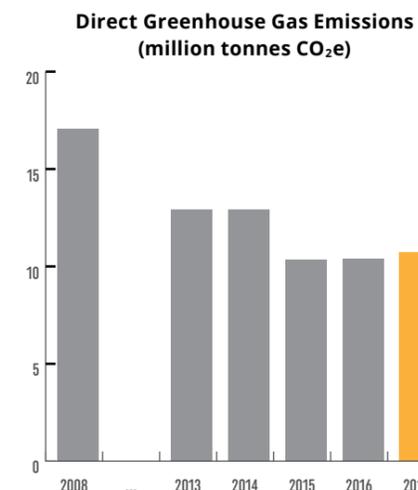
### Hydroelectric Generation

In December 2017, we announced the expansion of our renewable portfolio with the acquisition of a 35-megawatt (MW) hydroelectric facility in the state of Veracruz, Mexico. The acquisition reflects our continued focus on delivering reliable low-carbon electricity solutions to customers around the world. The Veracruz project adds to our hydroelectric portfolio, which includes our 32-MW Oldman River hydroelectric facility, which is jointly owned by ATCO and the Piikani First Nation.

In July 2017, the Oldman River facility received EcoLogo® certification. EcoLogo® is a voluntary, multi-attribute, lifecycle-based certification program that requires rigorous scientific testing and auditing to prove compliance with stringent, third-party environmental performance standards. Our Oldman River facility has been certified for reduced environmental impact electricity production, and earned approximately 130,000 Renewable Energy Certificates (RECs) in 2017. A REC is a tradable energy commodity that represents 1 MWh of energy generated from a renewable source, and can be sold to energy retailers.

# 130,000

Renewable Energy Certificates generated and certified by EcoLogo® through renewable electricity produced by our Oldman River hydroelectric facility in Alberta



Approximately 95 per cent of our direct GHG emissions are due to our power generation operations. Since 2008, we have reduced our direct GHG emissions by 37 per cent, and have also reduced emissions of nitrogen oxide and sulphur dioxide by more than 36 per cent. In 2017, our direct GHG emissions increased slightly due to an increase in electricity production. However, we have implemented operational efficiencies to reduce other environmental impacts from our power generation operations.

### Coal-to-Gas Conversions

Over the course of the year, we advanced plans to convert our coal-fired generating assets in Alberta to run on lower-emitting natural gas. These conversions would

enable continued operation of these important facilities, minimizing the immediate need for new infrastructure and continuing to support the province's interconnected electric system. In early 2018, we completed and fully commissioned a 50 per cent coal-to-gas co-firing project at one of our units at the Battle River Generating Station near Forestburg, Alberta.

Coal-to-gas conversions are an economical way to meet baseload power requirements, and are less than one-twentieth the cost of building a new natural gas facility. They also offer significant environmental benefits, including reducing existing GHG emissions by 40 per cent, reducing nitrogen oxides by up to 75 per cent, and eliminating emissions of sulphur oxides, particulate matter, and mercury. Perhaps most importantly, coal-to-gas conversions help limit the impacts associated with Alberta's coal phase-out to surrounding communities, many of which depend on these facilities for economic activity.

### Biomass

We continue to investigate the use of biomass and other alternative fuels. In 2017, we conducted a test at our Battle River facility to evaluate torrefied wood

biomass as a potential fuel source. The test indicated that few equipment modifications would be needed to use biomass in lower volumes, and would reduce GHG emissions by up to 20 per cent as well as lower other air pollutants. A larger test is planned for 2018 to include more detailed sampling and analysis.

### Fleet Vehicles

We own and operate a fleet of approximately 3,500 units, ranging from light-duty vehicles, such as pick-up trucks and vans, to heavy-duty vehicles. In 2017, we began implementing a telematics solution across the entire vehicle fleet. The goal of the system is to monitor and influence driving behaviour to improve fuel efficiencies by minimizing idling and hard braking. Installation is now largely complete, and we are finalizing the setup of the telematics software.

Altogether in 2017, our fleet reduced fuel consumption by approximately 1,000,000 litres - largely as a result of workload changes and general process efficiency improvements. With telematics made available to our business units, we anticipate additional fuel savings and improved driving behaviour in the future.



Our newly acquired 35-MW hydroelectric facility in the state of Veracruz, Mexico.



During construction activities associated with our Urban Pipeline Replacement Program in Alberta, we went beyond best practice during the replacement of a pipeline crossing a tributary to the Bow River. Typically, our standard practice for pipeline water crossings involves the use of horizontal drilling, which helps minimize impact to both the water body and its banks. In this case, however, the unique conditions of the soil prohibited that approach.

Ultimately, we elected to use an isolated open-cut method of pipeline installation, which requires that we divert water around the work area. We implemented the best water treatment technology available and worked actively to control erosion during installation. This multi-pronged approach ultimately enabled us to return the diverted water at a higher quality than before in a biologically sensitive area.

We took a similarly proactive approach to environmental management in construction of our Fort McMurray West 500-kV transmission line. Seventy-five per cent of the line will run through muskeg, a fragile peat bog that requires freezing temperatures to limit the environmental impact of construction activities. Recognizing these unique conditions, we have condensed transmission line construction to two winter seasons, each only three to four months long, which should substantially reduce our impact to the land.

### Methane

Although methane accounts for less than four per cent of our total GHG emissions, we proactively manage and reduce methane emissions associated with our natural gas pipeline operations. In addition to previously implemented reduction programs, in 2017 we planned an optical gas imaging program to improve our above-ground leak detection, which further pinpoints and quantifies fugitive emissions sources. The program will involve regular reviews of our 15 compressor stations, and is expected to significantly reduce methane emissions from fugitive sources.

### Reducing Our Indirect Impacts

We reduce our indirect emissions through the efficient use of energy and resources. For example, when constructing new facilities, we identify opportunities to minimize energy consumption. At our Jandakot Operations Centre in Western Australia, we carefully designed the facility to suit the Australian climate, including using tinted windows and gas-powered

air conditioning to minimize energy requirements. These initiatives have reduced our indirect GHG emissions by up to 100 tonnes of CO<sub>2</sub>e per year.

Our new global headquarters in Calgary, ATCO Park, is designed to LEED Gold specifications. The 241,000 sq. ft. campus was inspired by two iconic Alberta images - the Rocky Mountains and the flowing



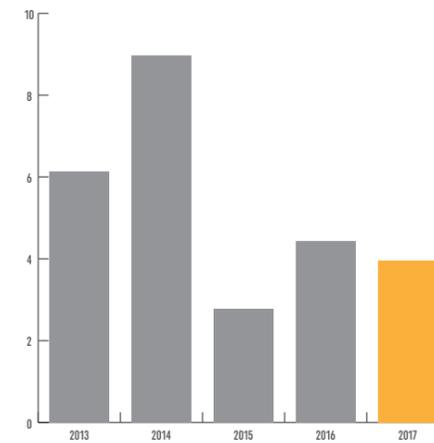
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lines of a prairie stream - and 95 per cent of materials involved in construction were locally sourced in Western Canada. The facility uses LED lighting throughout, with a controlled system that turns lights off when there are no occupants. We are in the process of evaluating the environmental performance of our new facility, and expect to confirm LEED Gold certification in late 2018.

To further improve the efficiency of our existing buildings, we are investing in a range of innovative technologies. In October, we partnered with CleanO2 Carbon Capture Technologies to install a CARBINX unit at our Whitehorn Operations Centre in Calgary, Alberta. The device will both capture carbon from combustion flue gas and reduce energy demands by recovering waste heat, resulting in a five per cent reduction in annual GHG emissions and a three per cent reduction in annual energy use.

Protection of the environment is a core value, and minimizing environmental impacts associated with our operations is the responsibility of all our people.

Volume of Reportable Hydrocarbon Spills (thousands of litres)



Hydrocarbon spill volume has decreased over the past year. The majority of hydrocarbon spills are related to our electrical business, and include third party incidents such as damage to electrical transformers due to automobile accidents and vandalism.

## ENVIRONMENTAL MANAGEMENT

We incorporate environmental considerations into the full lifecycle of every project, and regularly monitor, assess, and report our performance.

For example, for more than 20 years we have captured and recycled fly ash from our coal-fired electricity generation. Through the use of this fly ash as an input, our customers such as ready mix concrete providers, can reduce GHG emissions in addition to improving lifecycle costs and longevity of their concrete and cementing products. In 2017 alone, GHG emissions avoided by our customers by re-using this product were 175,000 tonnes, or the equivalent of removing approximately 40,000 vehicles from the road.

## Incident & Risk Management

We mitigate our environmental impacts through the systematic and responsible management of our operations. We are committed to continually improving our environmental and operational integrity programs through the regular sharing of best practices, and we report environmental risks and performance to the Audit & Risk Committee through our Stewardship Reporting processes.

One important aspect of risk management is preventing spills, and control measures are driven by best practices within each industry in which we operate. When spills occur, we assess the unique circumstances to ensure all appropriate steps are taken to minimize environmental impacts, remediate the area as required, and limit recurrence of similar incidents.

Due to the nature of the industries in which we operate, some examples of non-hydrocarbon liquids we handle include brine water and waste water. Consequently, although the volume can fluctuate year to year, there is typically a lower risk of adverse environmental impact associated with spills of these liquids.

Although the number of regulatory reportable spills remained the same, we saw a large increase in the reported spill volume of non-hydrocarbon liquids in 2017. We are continuously evaluating and improving spill prevention efforts and are working to implement a number of strategies including targeted repairs and process improvements to reduce these volumes moving forward.

### 2017 REPORTABLE SPILLS

	REPORTABLE SPILLS (NUMBER)	VOLUME OF REPORTABLE SPILLS (THOUSANDS OF LITRES)
Hydrocarbon	14	4
Non-hydrocarbon	7	2,059*

\* Of the non-hydrocarbon spill volume: 89 per cent was related to two incidents at one of our workforce housing facilities where treated waste water was discharged in excess of the daily limit; 11 per cent was related to a brine spill at one of our storage facilities, which was recovered via the existing ground de-watering system. The combined volume of the other four non-hydrocarbon spills was one thousand litres.

## Natural Gas Pipeline Integrity

We own and operate more than 64,000 km of natural gas pipelines, so the prudent management of this infrastructure is integral to our business. To help keep those pipelines and our communities safe, we work collaboratively with our peers to share and implement best practices. For example, the industry-led Integrity First® program established by the Canadian Energy Pipeline Association (CEPA) has identified several priority areas, including pipeline integrity, emergency management and control room management. Subject matter experts, drawn from each CEPA member, developed industry-wide guidance and self-assessment criteria designed to identify areas for improvement, as well as increase accountability and transparency throughout our industry.

In 2017, a self-assessment and independent third-party verification of transmission pipeline integrity found all areas to be continuously improving, proactive, or leading, according to the CEPA Integrity First® criteria. We also continued our aggressive in-line inspection program on transmission assets in 2017. We inspected nearly 2,300 km of line and increased in-line inspections by 10 per cent from 2016. Our target is to inspect all transmission lines more than eight inches in diameter and five kilometres in length by 2024. The success of in-line inspection and other integrity activities is evidenced by our performance - in 2017 we had less than one leak per 1,000 km of transmission pipeline.

In our natural gas distribution system, targeted programs to replace vintage steel and plastic assets within our communities continued in 2017. Significant improvements were also made to the distribution cathodic protection system to better monitor and protect steel piping systems from the threat of corrosion.