



North American Climate Leadership

A road map for global action on methane

“Failing to take action on methane would be a major missed opportunity to tackle near-term warming as the necessary longer-term reductions in carbon dioxide are implemented.”

–Fatih Birol, IEA Executive Director

In April, world leaders from 175 countries gathered to sign the landmark global climate agreement reached in Paris in December 2015. Now attention turns to what actions each country will take to achieve these goals and, in particular, what can be done immediately to change the perilous path we are on and rein in the record rate of warming that our planet is experiencing now.

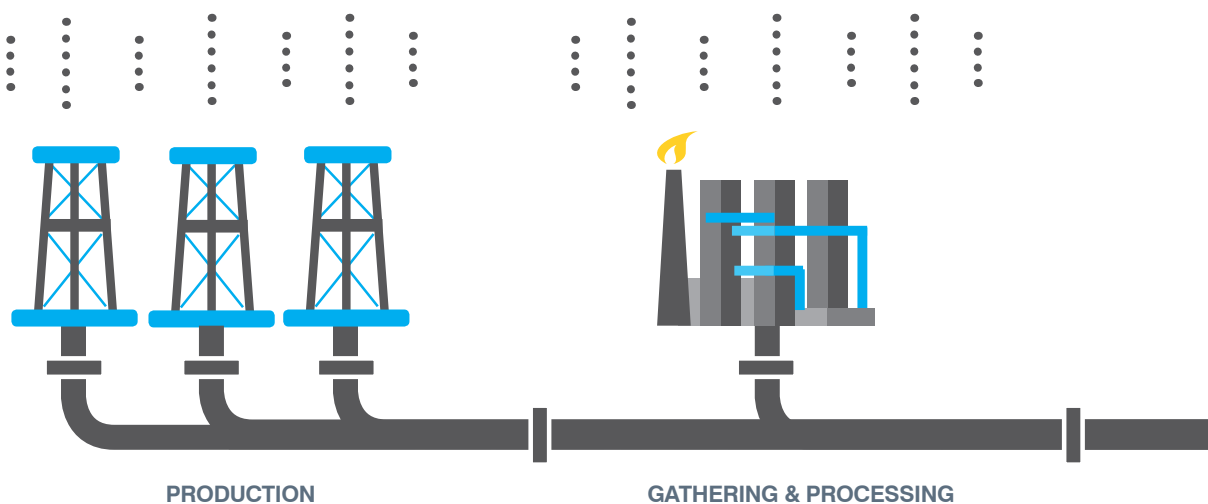
Research is also bringing into focus the difference between various greenhouse gases and the importance of reducing both powerful, long-lived climate pollutants like carbon dioxide (CO₂), along with potent, short-lived pollutants such as methane (CH₄).¹ Both require attention as long-lived climate pollutants dictate how warm the planet gets, while short-lived climate pollutants determine how fast the warming happens.

According to the International Energy Agency (IEA), reducing methane from the oil and gas sector—the largest emitting industry—is one of five key opportunities for achieving meaningful cuts in greenhouse gases.² It can be done affordably, with existing technology and with minimal impact on industry.³ As such, reducing oil and gas methane is one of the most effective tools we have to curb current warming while we simultaneously work to slow future warming vis-à-vis carbon dioxide reductions.

The United States, Canada and Mexico are three of the world’s largest oil and gas producing nations and are among the top five methane emitters.⁴ Together, they account for nearly 20% of global oil and gas methane pollution.⁵

A new summary report by ICF International identifies the significant opportunity these countries have to work together to reduce their oil and gas methane emissions. This is an opportunity that will make a critical difference in the rate of global warming right now and provide a road map for how other major oil and gas-producing and -consuming nations can reduce these potent emissions.

LEAKS OCCUR ACROSS THE OIL & GAS SUPPLY CHAIN



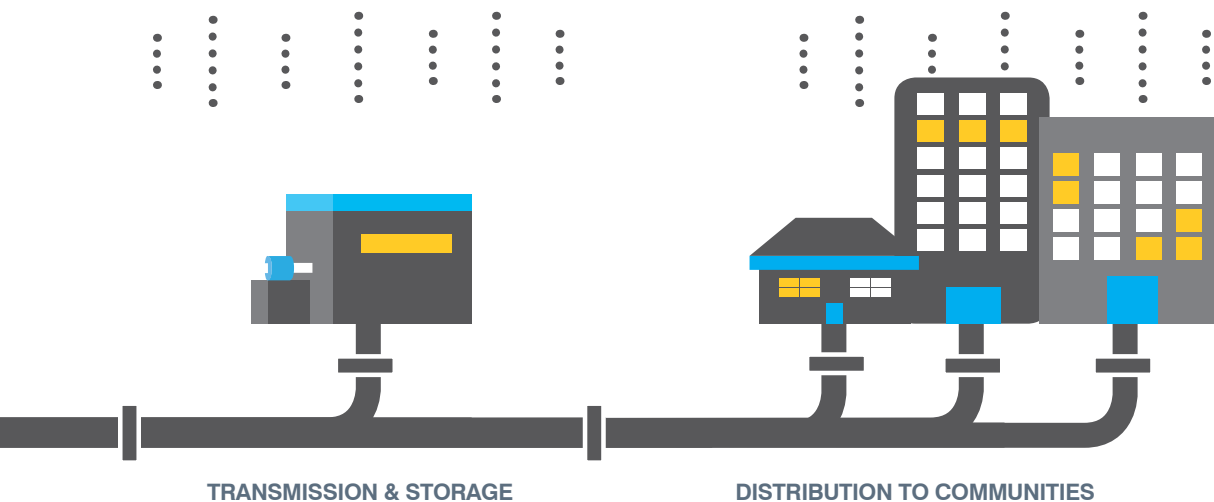
When challenge meets opportunity

Next to carbon dioxide, methane is the most impactful greenhouse gas. Though far more carbon dioxide is emitted globally, methane is incredibly potent. That's because while it decays faster than carbon dioxide in the atmosphere, methane packs 84 times more warming power for the first 20 years after it's emitted. Research indicates that 25% of current warming is due to manmade methane pollution.⁶

Globally, the oil and gas sector is the largest industrial methane source and in the U.S., the largest source, period. According to Rhodium Group, roughly 3.5 trillion cubic feet (98 billion cubic meters) of methane escaped from the global oil and gas supply chain in 2012. That amount of methane, equal to about 3% of global natural gas production, has the same near-term climate impact as about 40% of annual global coal combustion. And the problem is projected to get worse. Without action, global oil and gas methane emissions can be expected to increase almost 20% by 2030, compared to a projected 10% increase in carbon dioxide from energy use.⁷

Making improvements to equipment and facilities along the oil and gas supply chain is among the most attractive options to curtail this pollution. Moreover, the fixes are proven, low-cost and readily available today and many measures offer a positive return on investment. Rhodium Group estimates that global methane emissions represent \$10 billion in potential revenue.

Because it decays faster than carbon dioxide in the atmosphere, methane packs 84 times more warming power for the first 20 years after it's emitted.



Modest investment, massive payoff

Methane emissions in North America can be cut by 42%—or 232 billion cubic feet (6.5 billion cubic meters)—beyond what companies are already planning in the course of normal business using low-cost technologies to control emissions across the oil and gas supply chain, according to estimates from energy analysts at ICF International. Even at today's historically low gas prices, these cuts would add just 1¢ to the current price of gas. The technologies available to reduce these emissions can recover about half a billion dollars of gas a year.

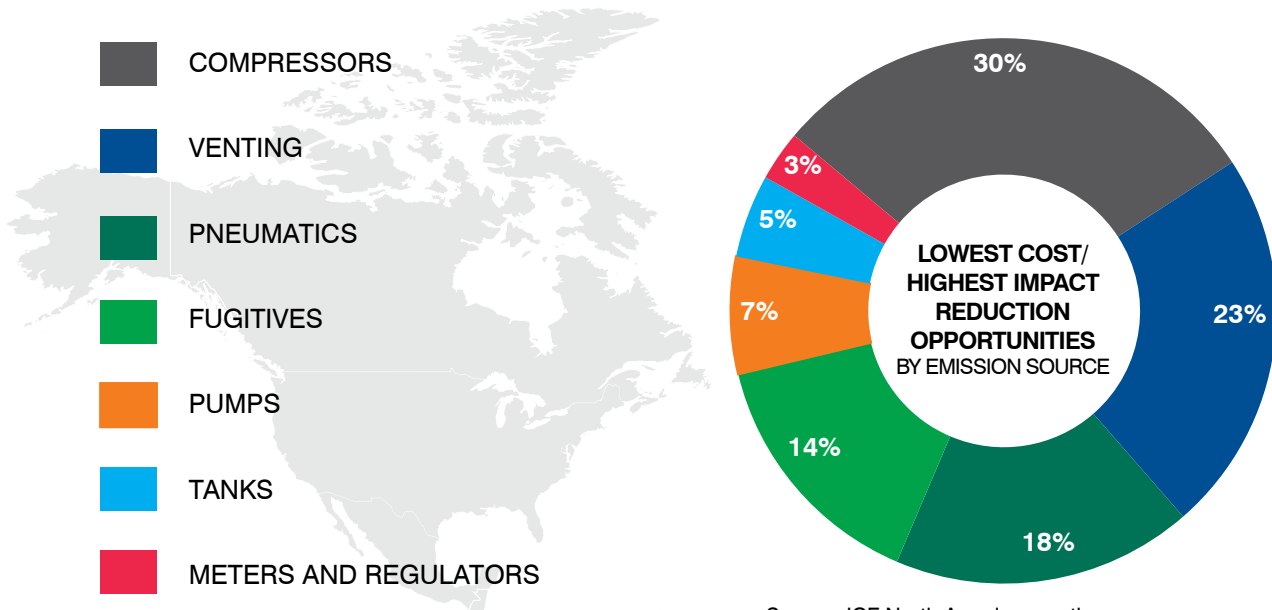
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Most remarkable about these options is their simplicity. These are not “moonshot” strategies. None of them requires industry to radically change its field practices. In some cases, these fixes are as easy as tightening loose valves and repairing leaky equipment found while conducting routine inspections. Such inspections are part of good operating practices that some leading companies use, but industry-wide implementation is needed to maximize its potential. Effective leak detection and repair programs are among the most inexpensive strategies to consider and can reduce over a third of North America's oil and gas methane emissions.⁸

Demonstrating that meaningful reductions are possible—technically, economically and politically—the United States and Canada recently agreed to cut up to 45% of methane emissions from the two countries' oil and gas sectors by 2025.⁹ This follows steps taken in Canadian provinces and U.S. states including Alberta, California, Colorado, Ohio and Pennsylvania to reduce this pollution.^{10,11,12,13,14}

ACHIEVING DEEP METHANE CUTS ACROSS NORTH AMERICA

MANY LOW-COST SOLUTIONS ARE AVAILABLE TO CUT ALMOST HALF OF OIL AND GAS METHANE

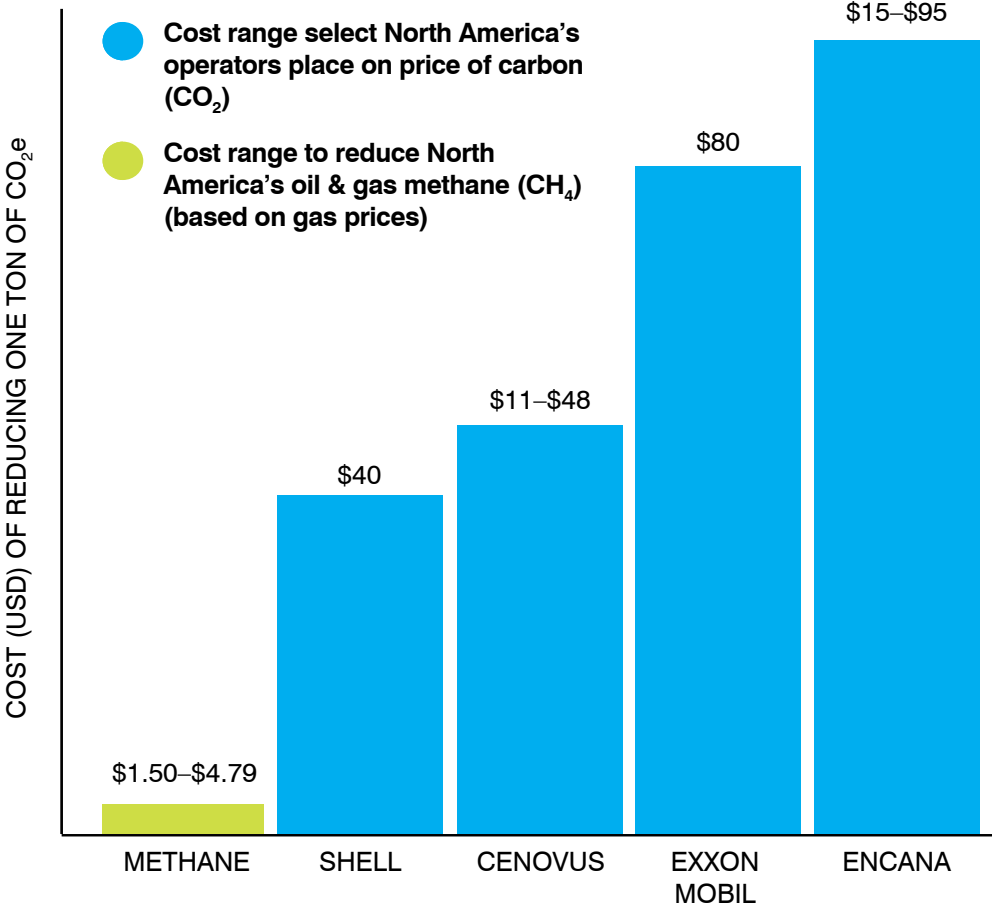


Source: ICF North American methane summary

COMPARING METHANE REDUCTIONS TO A CARBON PRICE

Some oil and gas companies use a carbon price when analyzing new commercial projects. It allows them to value the cost of emission reductions relative to the profit potential of a new facility.

As compared to the internal price of carbon that key North American oil and companies use, reducing their methane emissions is one of the best bargains to cut greenhouse gases quickly.



Carbon Price Source: "Putting a price on risk: Carbon pricing in the corporate world" 2015

A linchpin to global methane action

If someone offered a low-cost plan that could deliver the same climate benefit over 20 years as closing a thousand coal plants while recovering usable energy, we'd jump at the chance.¹⁵ That's the head start North America can deliver if the continent's leaders work together to seize the methane reduction opportunity identified by ICF International.

Ahead of the historic climate agreement signed in Paris last year, Mexico highlighted oil and gas methane emissions as one way to meet its greenhouse gas reduction targets. It now has the opportunity to demonstrate this commitment at the upcoming North American Leaders' Summit in Ottawa on June 29 and build upon the momentum generated by the U.S.-Canada methane pact. Taking a united approach on methane offers the added benefit of improved North American energy integration by making it seamless for multinational oil and gas companies to comply with comparable standards in all three countries.

North American action on methane would also extend the three countries' proactive climate leadership. In 2009, they joined together to address the production and consumption of hydrofluorocarbons, another dangerous greenhouse gas, resulting in a proposed amendment to the Montreal Protocol that would cut 90 gigatons of carbon dioxide equivalent emissions through 2050.¹⁶ This commitment catalyzed the international community, which appears close to endorsing the amendment later this year.

Once again, the United States, Canada and Mexico have a similar opportunity to lead the international community on a critical climate issue. Cutting 45% of North America's oil and gas methane emissions could eliminate nearly 10% of this pollution worldwide.¹⁷ A commitment of this size and significance could spur more international cooperation and ambition around the world. Coming off the hottest year on record, it's an opportunity we can't afford to miss.

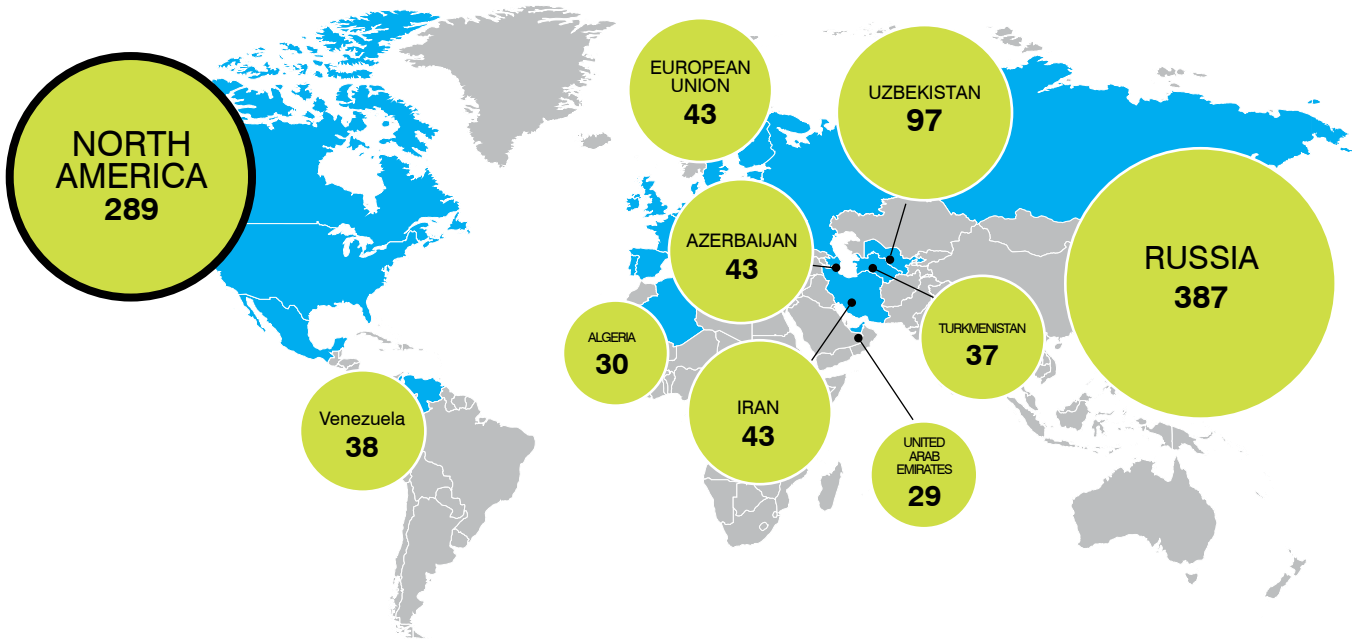
“What we know about the behavior of methane in the atmosphere makes this an urgent matter, and its solution can help reduce the impact of these emissions that contribute to global warming.”

–Dr. Mario Molina, Chemistry,
Mexican Nobel Prize winner



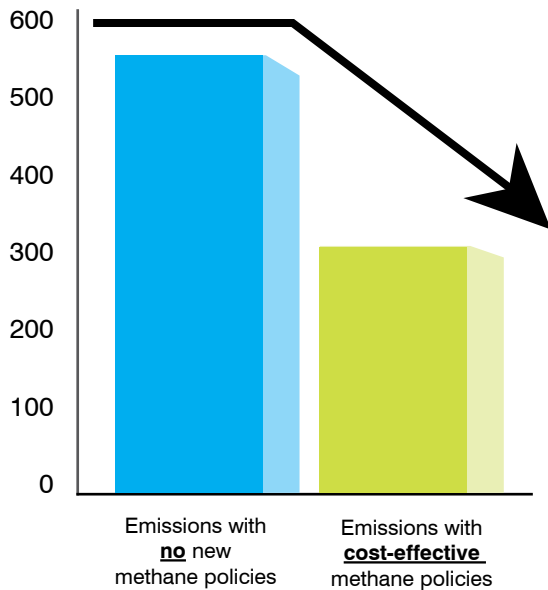
TOP OIL & GAS METHANE EMITTERS GLOBALLY

IN MILLION METRIC TONS CO₂e



WHICH FUTURE WILL NORTH AMERICA CHOOSE?

Projected North American Methane Emissions
In Billion Cubic Feet



About **2/3** of the world's **oil & gas methane** emissions are in these countries.

North America makes up **over 25%** of this pollution.

Canada & the U.S. are already working to **slash emissions 40-45%** through regulations.

If **Mexico** set a similar goal backed by regulations, together North America could achieve the same 20-year climate impact as taking **85 million** cars off the road.

➤ More than **double the total** amount of cars in Mexico.



Sources

- ¹ Shoemaker et al., *Science* 2013, <http://science.sciencemag.org/content/342/6164/1323>
- ² IEA World Energy Outlook, 2015, <http://www.worldenergyoutlook.org/weo2015/>
- ³ Five EPA whitepapers covering sources, mitigation techniques, 2014, <https://www3.epa.gov/airquality/oilandgas/methane.html>
- ⁴ Rhodium report, 2015, https://www.edf.org/sites/default/files/content/rhg_untappedpotential_april2015.pdf
- ⁵ Ibid.
- ⁶ EDF calculation based on IPCC AR5 WGI Ch. 8, <http://www.ipcc.ch/report/ar5/index.shtml>
- ⁷ IEA World Energy Outlook, 2015, <http://www.worldenergyoutlook.org/weo2015/>
- ⁸ ICF North America methane emissions summary report, <http://edf.org/north-american-methane-report>
- ⁹ U.S.-Canada climate pact, <https://www.whitehouse.gov/the-press-office/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership>
- ¹⁰ Alberta Climate Plan, <http://www.alberta.ca/climate-methane-emissions.cfm>
- ¹¹ California Air Resources Board, http://www.arb.ca.gov/cc/oil-gas/meetings/Draft%20ARB%20OG%20Regulation_Feb%201%202016%20Track%20Change.pdf
- ¹² Colorado Air Quality Control Commission, https://www.colorado.gov/pacific/sites/default/files/5-CCR-1001-9_0.pdf
- ¹³ Ohio Environmental Protection Agency, <http://epa.ohio.gov/dapc/genpermit/permitsec.aspx>
- ¹⁴ Pennsylvania Department of Environmental Protection, <http://www.dep.pa.gov/Business/Air/Pages/Methane-Reduction-Strategy.aspx#.VzYb1PMo6Ht>
- ¹⁵ EDF calculation based on Rhodium report, 2015, https://www.edf.org/sites/default/files/content/rhg_untappedpotential_april2015.pdf
- ¹⁶ U.S. State Department, <http://www.state.gov/r/pa/prs/ps/2014/05/225927.htm>
- ¹⁷ Rhodium report, 2015, https://www.edf.org/sites/default/files/content/rhg_untappedpotential_april2015.pdf