

Consumers Energy

Count on Us®



Methane Reduction Plan

November 2019



Consumers Energy Methane Reduction Plan

Consumers Energy loves Michigan and is committed to protecting the planet.

That's why we're fundamentally transforming the way we operate to fight climate change and create a clean energy future for generations to come. Our Clean Energy Plan will eliminate coal as a fuel source for electricity, boost renewable energy and reduce carbon emissions by 90 percent by 2040.

Now, we're voluntarily implementing changes to our natural gas business that will shrink our environmental footprint by significantly reducing methane emissions.

Our goal: Achieve net zero methane emissions for our natural gas delivery system by 2030

We've already reduced methane emissions from our natural gas distribution system by about 15 percent over the past decade. This report outlines the path to further emissions reductions by:

- Accelerating the replacement of aging pipe.
- Rehabilitating or retiring outdated infrastructure.
- Embracing new technologies and operational practices to keep gas flowing more safely and efficiently than ever.

We expect these measures — detailed in the following pages — to reduce our methane emissions by about 80 percent.

Unfortunately, emitting some level of methane is unavoidable with a vast storage and delivery system that stretches thousands of miles and includes about 1.5 million service connections. We plan to close that gap by including renewable natural gas (RNG), which has a negative methane footprint, in our supply portfolio.

Together, the two initiatives will help us reach net zero methane emissions for our natural gas delivery system by 2030. Along the way, we'll continue to explore and evaluate new strategies, technologies and possibilities.

By achieving our goal, we'll reduce our methane emissions by more than 10,000 metric tons — that's the equivalent of removing about 55,000 vehicles from the road for a year or preserving more than 300,000 acres of forest.

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Reducing methane, a greenhouse gas that's 25 times more potent than carbon dioxide, aligns with our Clean Energy Plan as a key component to combat climate change. We are committed to caring for people, protecting the planet and empowering Michigan's prosperity.

Our Natural Gas System

Consumers Energy, the primary subsidiary of CMS Energy, is a combined electric and natural gas utility that operates a natural gas system serving about 1.8 million natural gas customers in Michigan. Our natural gas system contains over 2,400 miles of high-pressure transmission pipelines, more than 27,000 miles of distribution gas mains and about 1.5 million gas service connections. We move over 386 billion cubic feet (Bcf) of natural gas through our transmission system annually and rank sixth in total sales volume among local distribution companies nationally.²

Compressor stations move natural gas through our intrastate transmission pipeline system, to and from our underground storage fields and to city gate stations, where the gas is odorized and pressure is regulated for safe delivery to homes and businesses.

We own and operate eight compressor stations and 15 underground gas storage fields with a total storage capacity of 309 Bcf. Compressor stations also receive supply from interstate and third-party pipeline sources. Compressor stations inject gas into storage fields during the summer when we can purchase gas at lower costs, transport gas through the system and withdraw gas from storage fields to increase system supply during the winter when demand is highest.

While methane remains in the atmosphere for much less time than carbon dioxide, it is about 25 times more effective at trapping heat than carbon dioxide.

Methane as a Greenhouse Gas

Methane is the primary constituent of natural gas. The United States Environmental Protection Agency (EPA) states that methane (CH₄) accounted for nearly 10 percent of all U.S. greenhouse gas (GHG) emissions from human activities.³ These emissions come from many sources, including development and transportation of oil and natural gas, livestock, solid waste disposal and waste water treatment. Methane also is produced naturally in some ecosystems such as wetlands. However, more than 60 percent of global CH₄ emissions come from human activities. As a greenhouse gas, methane in the atmosphere traps a portion of the heat radiated from the Earth's surface, contributing to climate change. While methane remains in the atmosphere for much less time than carbon dioxide (CO₂), it is about 25 times more effective at trapping heat than CO₂. Thus, finding ways to reduce methane from our operations is important to our larger fight against climate change.

Methane Emissions from Natural Gas Systems

Producing, processing, storing, transmitting and distributing natural gas can result in two types of methane emissions: vented gas or fugitive emissions.

Gas sometimes is intentionally vented to create safe working conditions for maintenance and repair, or as part of emergency testing procedures. Vented gas is typically tracked and associated with specific events or locations.

By contrast, fugitive emissions are distributed across the gas system and are usually associated with minute leaks along low-pressure pipe, fittings or valves that do not pose a public safety risk. Fugitive emissions are mitigated through robust system maintenance processes, leak survey and repair and the replacement of older, vintage materials and equipment.

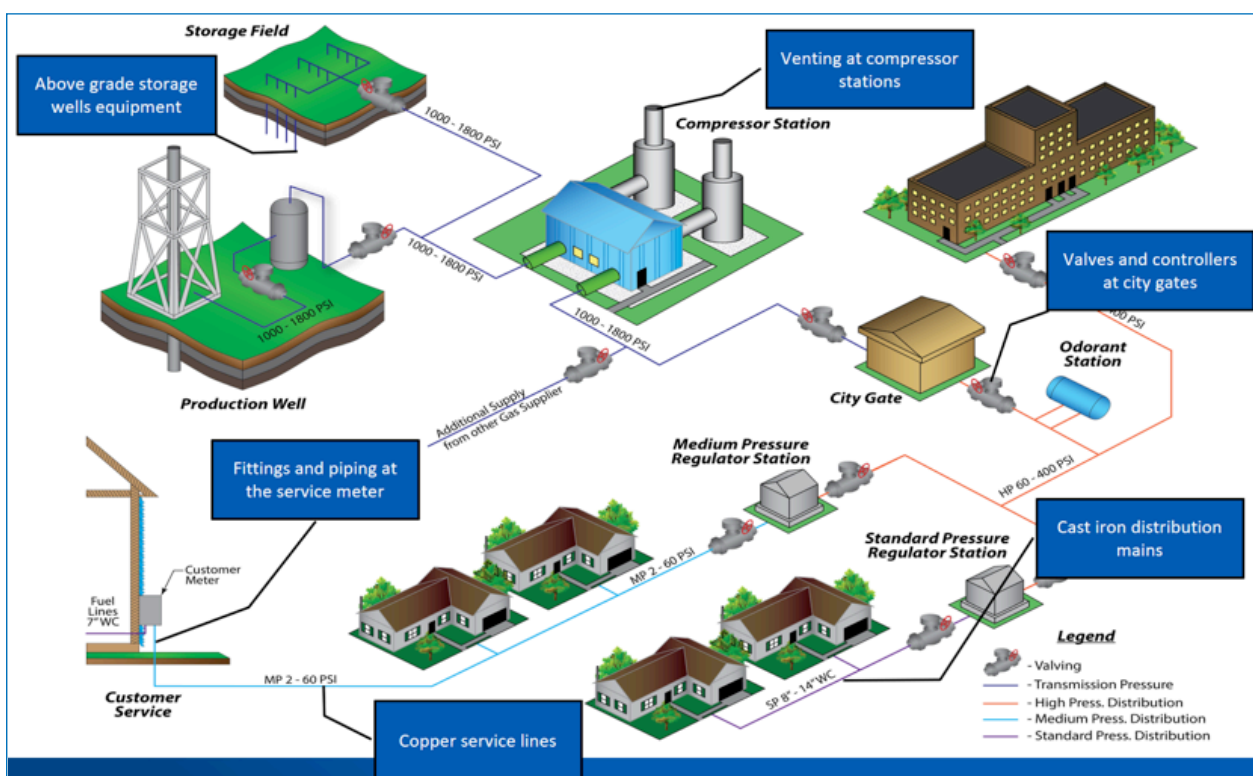


Figure 1 shows a typical natural gas system from production through distribution, along with potential sources of methane emissions.

The EPA requires owners of natural gas transmission, storage and distribution systems to report emissions of methane and other GHGs from certain sources annually if the emissions exceed a certain threshold. Gas system owners also can participate in voluntary reporting programs designed to reduce methane.

Voluntary Commitments

Consumers Energy joined the EPA Natural Gas STAR Program in 1996. The Natural Gas STAR Program is a voluntary effort to identify and reduce fugitive methane emissions from the storage and delivery of natural gas. For more than two decades, we have voluntarily reduced methane emissions as part of this program, including capturing and injecting natural gas back into our system while performing pipeline maintenance, replacing components that may have fugitive emissions, and implementing best management practices to reduce venting. We have reduced methane emissions by over 52,000 MT since joining the program.

In March 2016, we became a founding member of EPA's voluntary Methane Challenge program, a commitment to use best-management practices to further reduce fugitive methane emissions. We've committed to reduce cast iron and unprotected steel distribution mains — a common source of fugitive emissions — at a minimum rate of 3 percent per year by 2021, and to maintain that rate for at least five years.

What We're Doing Now

Cast Iron Main Replacement – Enhanced Infrastructure Replacement Program

Distribution mains are the pipelines connecting the natural gas transmission system to the service lines that deliver gas to individual customers. In 2011, we started an Enhanced Infrastructure Replacement Program (EIRP) to ensure continued safe, reliable operation by replacing all cast iron, wrought iron, threaded and coupled steel, oxyacetylene-welded steel, copper and bare steel distribution mains with plastic and coated steel mains. The new pipes require less maintenance and leak less, lowering fugitive methane emissions. Our gas engineering teams select EIRP projects using a risk model to prioritize system replacements, reducing overall system risk by the maximum amount in any given year. While focused on distribution mains, this program also includes vintage material replacements of transmission and storage pipelines.

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We plan to spend at least \$100 million annually on the EIRP program. Through 2018, we have replaced 425 miles of transmission, storage and distribution pipeline, including 157 miles of cast iron and over 43,590 services. We've also eliminated copper and Xtrube metal gas mains.

Initially, we planned for the EIRP program to last 25 years, finishing in 2036. But we will seek approval from regulators to complete the work by 2030, replacing a total of 2,700 miles of distribution pipeline. Accelerating this program by six years will avoid over 1,480 MT of methane emissions that would have occurred between 2030 and 2036.



Vintage Service Line Replacement Program

Services lines deliver natural gas from the distribution main to the customer. Our Vintage Service Line Replacement (VSR) program will replace all services such as copper and bare steel that are no longer used as a modern practice. Prior to launching the VSR program in 2017, we replaced roughly 3,000 vintage services annually. The VSR program has tripled our replacement rate to over 9,250 services per year.

Vintage service lines leak more than modern pipes because materials such as copper and bare steel deteriorate more easily over time. The VSR program accelerates the replacement of these materials and reduces associated fugitive emissions. Since the program began, we've replaced more than 25,000 vintage services — with roughly 149,000 vintage services remaining. Like the EIRP, we will seek approval to accelerate completion of the work by six years to 2030, spending nearly \$40 million a year to avoid emissions from these older service lines.

Well Rehabilitation Program

In 2017, we started a 10-year effort to rehabilitate natural gas storage wells, increasing overall well integrity and performance. We assess all storage wells for overall integrity, in addition to other safety, environmental and performance standards. Underperforming wells are typically plugged or replaced with wells constructed of modern materials. The process of plugging a well removes all above-grade equipment such as valves and flanges that may contribute to fugitive emissions. To date, we've retired 25 wells, which is expected to reduce methane emissions by about 60 MT.

Wellhead Protection Program

Many of our gas storage assets are in rural areas where large agricultural equipment operates near above-ground gas infrastructure. In 2017, we developed a wellhead protection program to mitigate the risk of accidental, third-party damage. A severed wellhead at our largest storage field, for example, could result in an uncontrolled gas release. Under the program, we've begun installing guardrails and other physical barriers to protect wellheads.

To date, we've implemented wellhead protection measures at more than 200 gas storage wells and we plan to complete 500 more by 2036. While wellhead protection efforts do not immediately reduce methane emissions, they reduce the risk of an unplanned, uncontrolled methane release.

Temporary Compression on Transmission Pipeline

For employee and public safety, we must lower pressure and remove natural gas from a high-pressure transmission pipeline before performing maintenance and other work.

Historically, we reduce the pipeline's pressure as much as possible by rerouting the gas into neighboring pipelines, then vent the remainder of the gas to create a safe working condition.

The venting practice, while standard in the industry, results in methane emissions and wastes valuable natural gas. That's why over the past decade we've implemented temporary compression technology and procedures to drawdown pipelines using city gates or compressor

stations. The drawdown procedures and use of temporary compressor technology allows us to transfer more natural gas to adjacent pipelines and significantly reduces the volume vented to the atmosphere. We also proactively replace transmission pipelines to reduce the number of repair projects and lower the likelihood of venting.

In 2017, 56 percent of our projects on transmission pipelines used temporary compression, saving 149 million cubic feet (MMcf) of gas and avoiding 2,700 MT of methane emissions. In 2018, 72 percent of transmission projects used temporary compression, saving 173 MMcf of gas and avoiding over 3,100 MT of methane emissions. In 2019, Consumers Energy plans to use temporary compression or drawdown procedures on all transmission projects, generating a projected savings over 190 MMcf of gas and avoiding about 3,460 MT of methane emissions.

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We are committed to using drawdown procedures and/or temporary compression for planned transmission projects. As part of our efforts, we plan to increase our average annual rate of use from about 76 percent to 90 percent by 2030. Based on historical averages, this commitment has the potential to prevent around 36,000 MT of methane emissions through 2030.

Impact of Current Programs and Practices

Our current programs and practices to reduce methane emissions exemplify our commitment to the planet. Replacing pipelines and wells with modern designs and materials, or retiring unnecessary infrastructure, reduces emissions. Similarly, protecting wellheads from damage proactively reduces emission risk.

From 2011 to 2019, Consumers Energy has reduced its methane emissions by 10 percent across the entire delivery system. Continuing current programs and practices will reduce total methane emissions by 40 to 50 percent (over 5,300 MT) by 2030.

Our Plans for the Future

We must do more to reach a net zero methane emissions goal. That's why we're working on a variety of options to achieve industry-leading methane reductions in the coming decades.

In 2018, we formed an interdisciplinary task force of engineers, system operators and environmental experts to evaluate the methane emissions created by our natural gas system and explore ways to reduce them. That meant estimating the emissions footprint for each relevant asset and quantifying the system-wide potential to reduce methane emissions. The 20-member task force evaluated 30 different industry best practices and internal programs and determined the following programs and practices are feasible for our natural gas system.



Increased Damage Prevention Targets

Occasionally, third parties damage natural gas infrastructure and inadvertently cause methane emissions. An excavator, for example, can accidentally damage a gas pipeline while working on a large civic project such as repairing roads or water mains. In 2018, there were over 2,000 excavation damages on our gas system that resulted in methane emissions. The emissions range from less than 1 cubic foot when a small gas service is damaged, to larger gas losses when a gas main is damaged. An estimated 65,400 Mcf of gas was lost in 2018 due to excavation damages.

We reduce damage incidents and associated emissions through an internal damage prevention program and by participating in the MISS DIG system. Now, we plan to reduce the damage rate by 40 percent over four years.

Our role in the MISS DIG system is to locate and mark our gas mains and services upon request prior to third-party excavation activity. We responded to 414,000 MISS DIG staking requests in 2018. In addition, our public safety outreach (PSO) employees visit contractor worksites to ensure use of safe digging practices like hand exposure of gas facilities before using power excavating equipment. The PSO team also trains contractors on safe digging practices and the dangers associated with excavating near natural gas infrastructure. Similarly, our Pipeline Public Awareness program promotes safe digging practices for the public. This program, among other things, educates homeowners on the need to call MISS DIG at 811 at least three days prior to any digging.

Our goal is to reduce the current damage rate from about 38 events per 1,000 system miles in 2018 to 23 events per 1,000 system miles in 2022. This reduction would avoid 133 MT of methane emissions.

Accelerated Leak Reduction Program

Natural gas pipelines, especially those at lower pressure like distribution pipelines, can leak gas and thus contribute to emissions. Our leak detection program tracks leak repair as required by federal regulations. We're striving to exceed federal and state regulations and lead the industry by repairing leaks at a faster rate.

Therefore, we have initiated an accelerated leak reduction program with the goal of achieving first-quartile ranking among utilities. Meeting this goal would reduce our total system leaks by over 90 percent from current levels and reduce methane emissions.

Asset Retirements

As part of a 10-year strategic planning process, we evaluate our gas system performance in certain key areas, including the environmental footprint of each asset. By including an estimated emission profile of each asset, our strategic asset planning should reduce methane emissions without compromising the delivery of safe, reliable and affordable natural gas.

We are evaluating whether to retire underused and underperforming assets within the gas storage fields, including numerous gas storage wells and associated pipeline infrastructure. If these assets are retired, we expect to reduce emissions by about 6 MT.

Renewable Natural Gas

Renewable natural gas (RNG), a pipeline quality gas derived from biomass or other renewable sources, is a critical part of our goal to have net zero methane emissions. In most cases, the sources of renewable gas — such as farms or wastewater treatment facilities — emit methane to the atmosphere. Methane that would otherwise be emitted is captured, conditioned for quality and used in the natural gas system. RNG is usually a carbon-negative fuel due to this capture process and will help compensate for any remaining unavoidable emissions on our natural gas system.

By investing in this sustainable resource, we are contributing to the growth of the RNG industry. Our investment provides sectors such as agriculture and transportation with innovative opportunities to reduce their greenhouse gas emissions.

Committed to Industry Best Practices

In addition to evaluating the expansion of current practices, the task force has identified the following practices and infrastructure changes for continued evaluation.

Compressor Engine Rod Packing

Compressor station engines help pull gas from storage fields and push the gas through our system. Each compressor engine and associated cylinders are fitted with piston rods and required “packing systems” that maintain a seal around the piston rod to prevent high-pressure gas from leaking. Even in new condition, however, packing systems have some small leaks. As these systems age and engine alignment changes, more leaks tend to occur. We will continue to evaluate how best to align rod replacement schedules with packing replacements to reduce emissions. We’ll also continue to evaluate the use of emission monitoring equipment to quantify and reduce emissions associated with compressor stations.

Compressor Station Emergency Testing

We are required to conduct annual tests of the fire gate systems at our compressor stations. These tests simulate the venting of natural gas from a compressor station upon detection of an ignition source. Thus, fire gate testing causes methane emissions. Several Consumers Energy compressor stations are equipped with block valves that function as a bypass system, significantly reducing emissions to the atmosphere during testing. We will evaluate the remainder of the compressor station sites for technical feasibility of similar technologies that reduce or eliminate emissions during fire gate testing.

Distribution System Leak Survey and Maintenance Alignment

We survey for methane leaks at our city gates and use this data to calculate methane emissions from our regulator stations and valve sites. In addition, several of these sites are rebuilt or upgraded each year, which can reduce fugitive emissions at these sites. While emissions from these systems are a small portion of our overall emissions, simple procedural

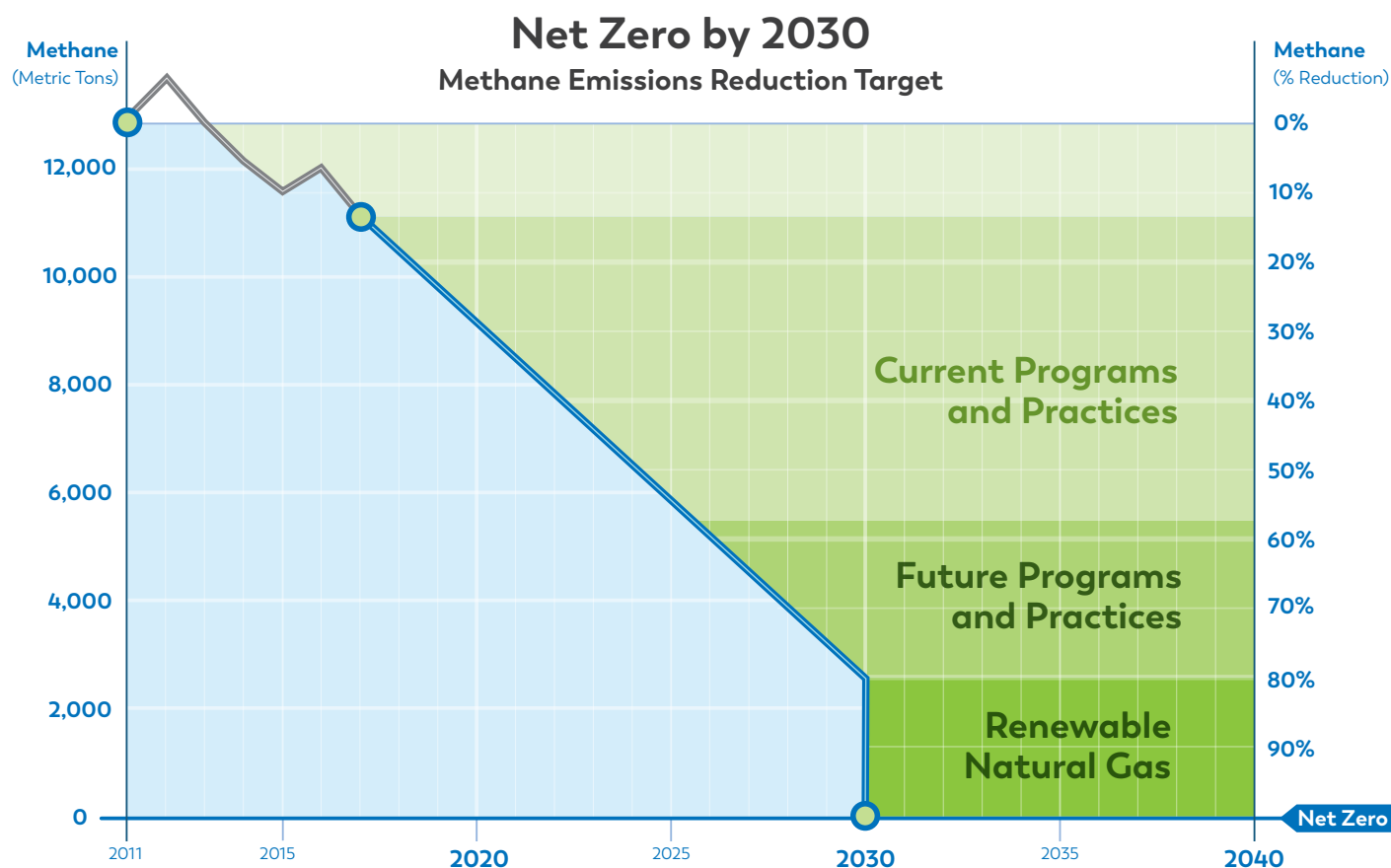


Figure 2. Consumers Energy is committed to industry-leading emission reductions across our operations — and is setting the ambitious target of a net zero methane emission gas delivery system.

changes and alignment can efficiently reduce methane emissions. We’ve begun aligning leak surveys and findings with upgrade and maintenance schedules to prioritize sites with higher emission levels. This alignment is expected to lower emissions for these assets over the long term.

Future Technology Evaluation

Future technologies may provide more opportunities to reduce methane emissions and allow us to measure our total system emissions more accurately. Currently, we measure certain methane emissions directly and use EPA emission factors to estimate others. As monitoring and data improve, we remain committed to a net zero methane goal. We will also evaluate whether we can apply new technologies to our natural gas delivery system.

Net Zero Goal

Consumers Energy is committed to industry-leading emission reductions across our operations — and is setting the ambitious target of a net zero methane emission gas delivery system.

To accomplish this goal, we plan to reduce methane emissions from our natural gas delivery system by about 80 percent by 2030 from 2011 levels. This goal builds on reductions achieved through existing programs such as EIRP, VSR, and Well Rehabilitation. These known opportunities are expected to reduce methane emissions as much as 50 percent. Meeting the challenge of an 80 percent methane reduction will require commitment to new practices, exceptional performance and innovative solutions.

We plan to purchase RNG to further reduce the environmental impact of methane emissions and achieve net zero methane emissions by 2030. By purchasing RNG, we will help grow an innovative, sustainable energy source. Our net zero methane goal allows our gas delivery system to remain agile to meet customer demand today and in the future. As infrastructure needs change and better methane monitoring occurs, we can increase RNG purchases as needed. This agility ensures our methane emissions remain net zero, while maintaining reliable operations and industry-leading environmental performance.

We plan to purchase renewable natural gas to further reduce the environmental impact of methane emissions.

1. United States Environmental Protection Agency, Greenhouse Gas Equivalencies Calculator (2019). Retrieved from: www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

2. www.aga.org/contentassets/d68b868b7cd94ed2889b704b441ab469/1002totvol.pdf

3. United States Environmental Protection Agency, Overview of Greenhouse Gases (2019). Retrieved from: www.epa.gov/ghgemissions/overview-greenhouse-gases#methane





CONSUMERS ENERGY METHANE REDUCTION PLAN

This report contains "forward-looking statements" which may cause our results to differ materially. All forward-looking statements should be considered in the context of the risk and other factors detailed from time to time in our Securities and Exchange Commission ("SEC") filings.

Forward-looking statements should be read in conjunction with "FORWARD-LOOKING STATEMENTS AND INFORMATION" and "RISK FACTORS" sections of our most recent Form 10-K and as updated in other reports we file with the SEC, which can be found on our Regulatory Filings page.