

The Accenture logo, featuring the word "accenture" in a white, lowercase, sans-serif font. A small white chevron symbol is positioned above the letter 't'.

accenture

# More than hot air

Energy companies now have the digital tools, value models and incentives to tackle methane emissions



# Sustainability

## A force of nature

Accenture has recently pledged its support for the Aiming for Zero Methane Emissions Initiative, launched by the Oil and Gas Climate Initiative (OGCI) in 2022. The initiative aims to eliminate the oil and gas industry's methane footprint by 2030.

Setting net-zero targets and embedding sustainable business practices and capabilities across the enterprise are no longer optional. This is especially true in the energy industry, where consumers, business partners, regulators, investors and employees are demanding that companies act.

Sustainability is an imperative. A force of change. A guiding principle that should underpin any business's growth strategy and permeate every functional area.

**Methane mitigation and management should be key components of the world's energy future. The time to act is now.**



In October 2022, three United Nations agencies published reports that came to the same dire conclusion: Given the lack of action among countries and industries to reduce greenhouse gas emissions, there is no longer a “credible pathway” to limiting the rise in global temperature to 1.5° Celsius.<sup>1,2</sup>

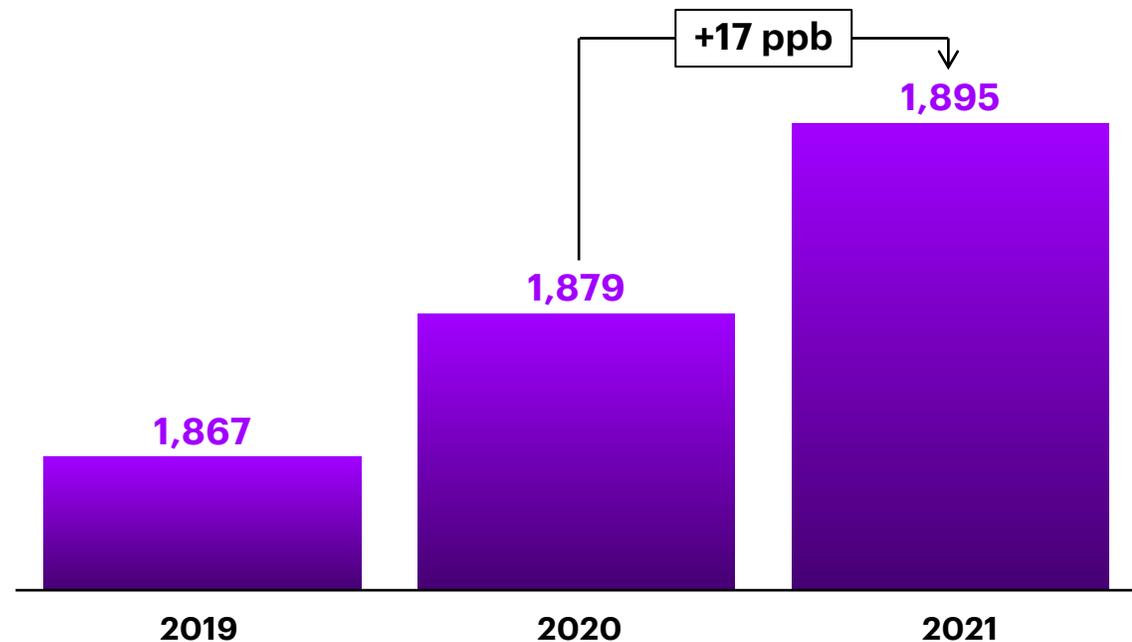
Despite national pledges to reduce emissions by 2030, the volume of emissions that heat the environment hit record highs in 2021.

The surge in methane emissions over the past year is particularly alarming. The latest report from The Intergovernmental Panel on Climate Change (IPCC) indicates that methane levels are higher than at any time over the past 800,000 years.<sup>3</sup>

## Methane levels are rising dramatically

### Atmospheric methane levels (parts-per-billion or PPB)

The largest annual increase recorded (since systematic measurements began in 1983)



**Note:** October 2022: 1920.34 ppb (+12.22 ppb y-o-y)

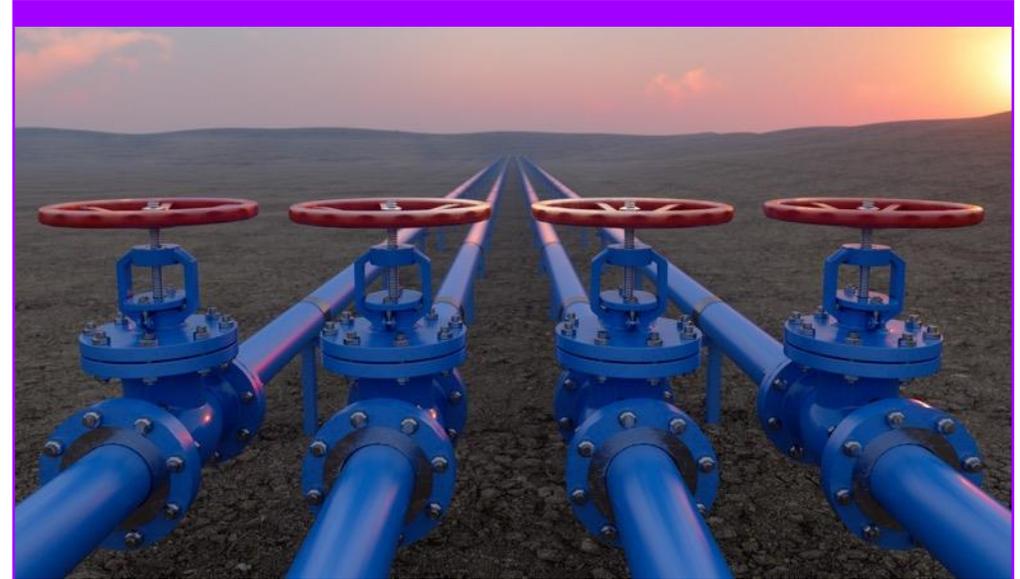
**Source:** U.S. Department of Commerce, National Oceanic & Atmospheric Administration ([NOAA](https://www.noaa.gov/))

# The methane challenge

Methane is one of the world's most potent greenhouse gases.

Even small amounts of methane can have a significant warming effect on the planet. In fact, methane is responsible for approximately 30% of the increase in global temperatures since the industrial revolution.<sup>4</sup>

There are several sources of methane emissions, including the extraction and transportation of fossil fuels. The recent rise in methane emissions can be, in part, attributed to the world's embrace of natural gas as a transition fuel. The war in Ukraine and its subsequent impact on energy flows to Europe have underscored the significance of gas as a key source of energy and methane.



## 23%

**Oil and gas extraction, processing and distribution account for approximately 23% of methane emissions globally.<sup>5</sup>**



The 2022 IEA Methane Tracker ranks Russia, the United States and Iran as the world's top sources of methane emissions from their respective oil and gas industries. Regardless of location, industry players contend with three main sources of emissions.

More than two-thirds (68%) of the energy industry's methane emissions are "vented." That means they are released during maintenance activities by valves and blowdown vent stacks to limit pressure on the system. Another 10% occur during flaring events due to incomplete combustion. The remaining 22% of emissions are so-called fugitives, expelled via leaks across the infrastructure.<sup>6</sup>

Further, while some methane emissions are a normal byproduct of extraction and production activities, super-emitting events also occur. These large, one-off incidents are more difficult to predict, detect and control.

# The methane opportunity

To achieve their net-zero ambitions, energy companies are increasingly focused on reducing their emissions and scaling and expanding clean energy technologies and supplies.

This is happening even as companies now divert more of their attention to securing energy in the aftermath of Russia's invasion of Ukraine. Our recent survey of more than 200 companies showed the majority (58%) are placing greater importance on energy sustainability.<sup>7</sup>



**On average, 4% of natural gas is released as methane during gas production, processing and transportation activities each year.<sup>8</sup> That equals ~180 billion cubic meters of gas—more than the amount of Russian natural gas imported by Europe before the Ukraine invasion.<sup>9</sup>**

**If all methane emissions were captured and made available as natural gas on the market, they would equal the size of the 6<sup>th</sup> largest production market worldwide.**

# There are several reasons that methane management should be a cornerstone of energy companies' sustainability agendas.



## Climate impact.

Methane has a warming factor of 84X compared to CO<sub>2</sub> over 20 years on a per-ton basis. For the energy industry, methane is particularly pernicious; it makes up nearly half of the industry's Scope 1 emissions.<sup>10</sup> Without addressing their methane emissions, energy companies will find it difficult, if not impossible to reach their 2050 net-zero targets. Accenture analysis with data from IEA, CAIT and S&P Capital IQ ESG.



## Financial gain.

Methane is a greenhouse gas that can be mitigated at a relatively low cost—approximately \$8/MMBtu.<sup>11</sup> Already, 50% of methane reduction activities generate positive net present value (+NPV). By 2024, most mitigation activities are expected to demonstrate +NPV. Additionally, methane is commercially monetizable. It's an opportunity worth billions of dollars for the industry.



## Stakeholder pressure.

Investors, activists and consumers are increasingly cognizant of the damage that methane causes to the environment. They are demanding companies responsible for methane emissions to act—fueling interest in additional carbon tax legislation. The technologies and the funding (thanks to energy companies' record profitability in the past year) for mitigation are available.

# Methane momentum

Energy companies are starting to recognize that methane management presents a unique opportunity for them to reaffirm their decarbonization commitment—and generate new revenue in the process.

Leaders have started to set methane targets. Yet, according to Accenture's most recent [Oil and Gas Reinvention Index](#), fewer than 15% of energy companies have set methane targets in line with the Global Methane Pledge, which calls for a 30% reduction by 2030.



**Setting net-zero targets is the critical, first step to reducing emissions by 2050. And it works.**

**Recent [Accenture research](#) found that companies with such targets cut emissions faster than those without. And those with more sophisticated measures cut even faster.**

Leaders have also started designing new infrastructures to enable zero methane. A few are even incorporating these infrastructures, along with data and applications, to form a strong digital core that ultimately addresses multiple needs of the organization.

This tactic is particularly relevant among the small number of companies now engaged in [Total Enterprise Reinvention](#). These reinventors are shifting from a technology landscape characterized by static, standalone parts to interoperable pieces. They are making a strong digital core a primary source of competitive advantage.

Energy companies would be wise to follow these reinventors' lead. While retrofitting old systems to a new digital infrastructure can be costly and time-consuming, the action is necessary. Without accelerating investments, the industry will be unable to address the methane problem in a truly meaningful way.

Drastic actions should be taken to curb, if not eliminate, emissions from across the energy value chain.

### **We feel such actions are about to occur. Why?**

Because pressure for change is mounting. And because three breakthrough developments have now made methane management practical—and affordable.

**If energy companies act now to tackle the methane crisis, there is still a chance that we will avoid the most calamitous long-term effects of climate change.**

## Breakthrough 1

# New digital methane management platforms

To date, the energy industry's approach to methane management has been fragmented, comprising a host of costly monitoring tools and equipment, and siloed across various operational entities. Such solutions have made it difficult for energy companies to analyze accurate emissions data at scale—and remediate problems quickly.

What has been lacking is a single, affordable platform that can address and integrate the main components of an effective methane mitigation program. These include enhanced detection and measurement capabilities, machine learning-based insights for better decision-making and modified operating practices and equipment to enable fast net zero-methane actions.

Such platforms are now being developed to accommodate different combinations of technology solutions. They are underpinning the digital core that will create a competitive advantage.



Accenture has created a **Methane Emissions Monitoring Platform** that facilitates the integration of multiple data streams and embeds key methane insights into business operations to drive action.

The cloud-based platform, which runs on Microsoft Azure, not only enables energy companies to measure baseline methane emissions in real time from gas distribution systems, but also detect leaks using satellites, fixed-wing aircraft and ground-level sensing technologies. Importantly, it integrates multiple methane-detection and operations-related data streams to optimize cold venting and flaring.

**Moving forward, we will be incorporating and refining capabilities, in partnership with Microsoft and their methane investments, to move toward prediction of emission events, effective quantification and source attribution.**

## Breakthrough 2 New value models

New digital tools and platforms will underpin future methane management programs. They are necessary. But they, by themselves, will not enable companies to eliminate methane emissions entirely.

Leading companies know that achieving zero methane requires more than technology. It requires a shift in how people work, how new capabilities are created and enhanced, how performance is measured and how processes and workflows are reengineered to support a zero-methane future.

Holistic models that enable what we call “360° Value” are now emerging.

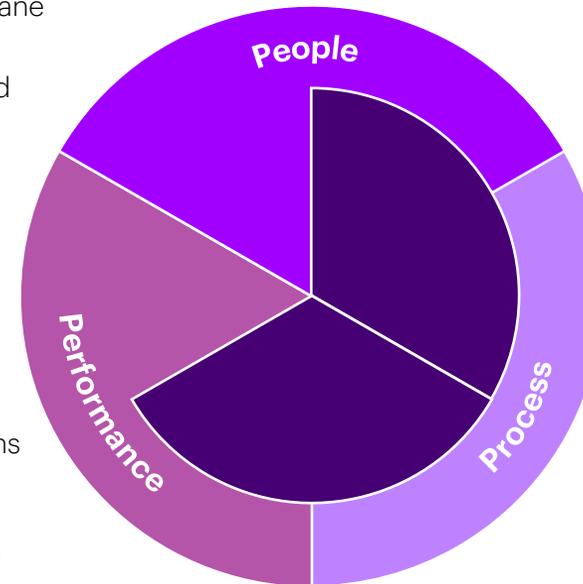
## Getting to zero methane requires more than a platform —it requires a 360-degree value approach

### People and Change Management

- Translation of corporate goals into practical methane management measures
- Tailored engagement and communications plan
- Training on platforms and new workflows

### Reporting and Performance Measurement

- Incorporation of emissions in key performance and financial metrics (inc. impact of risk avoidance)
- Driving end-to-end transparency of methane emissions (and reductions) by process, value chain elements, assets and geographies



### Process and Workflows

- Integration of methane emissions management into business planning and field development planning
- Enhanced production surveillance decision making
- Enhanced simulation and predictive capabilities to transform workflows to focus on emissions alongside efficiency
- Optimized operations processes (leading to flaring/venting events) to be zero methane
- Informing retrofit strategies for equipment and facility design
- Providing end-to-end methane certified accounting to establish market for zero methane product

### Breakthrough 3

## Emergence of standardized policies and incentives

Policies aimed at reducing methane emissions vary widely. A carbon tax, for example, places a price on emissions (including methane) and is an effective way to encourage businesses to limit them. Emissions trading schemes, which place a cap on emissions and offer tradeable allowances, are also gaining in popularity.

Countries and states apply different prices and incentive mechanisms based on their unique circumstances and industry environment. The lack of a standardized, widely adopted pricing scheme has helped to create a patchwork of different monitoring and reporting approaches.

The good news is 46 countries and states have carbon prices or emissions trading schemes (or both) in place, with approximately a dozen more considering their options.<sup>12</sup> As more jurisdictions adopt such policies, it is inevitable that more energy companies will set methane targets and adopt more consistent technology standards, reporting requirements and best practices.



The recently passed Inflation Reduction Act (IRA) in the United States marks the single largest investment in climate and energy in American history.<sup>13</sup> The legislation targets methane emissions and levies charges against the largest emitters.

**Our analysis suggests the total cost imposed on the industry (primarily on the top 20 upstream and midstream operators) would exceed \$700 million by 2024 and \$1.8 billion by 2026.**

This sort of legislation—and other similar efforts around the world—places accountability for methane action (and inaction) at the top of C-suites' agendas.

# The future of methane management

Getting to zero methane emissions is increasingly possible. The technologies needed to abate it are mature and readily available. And digital platforms are now being developed to integrate the complex components of an effective methane management program.

What is now needed is a shift in focus—from methane detection and repair to prediction and prevention. From a 30% reduction goal to methane-free gas. And from regulatory frameworks that encourage fragmented approaches to a more consistent framework, supported by end-to-end integrated methane-management platforms.

The future of methane management is very different from the past

	From	To
What	 ~30% reduction target,* lowering intensity	 Near-zero methane; methane free gas sales
	 “Detect and fix” (current focus of O&G companies)	 “Predict and prevent”
How	 Regulatory reporting compliance plus “experiments” (current focus of O&G companies)	 Integrated methane management capabilities and platform

\* Between 2020 and 2030

## Case study

# Duke Energy

To support its goal of net-zero methane emissions in its natural gas business by 2030, Duke Energy teamed with Accenture and Microsoft to launch a first-of-its-kind methane-emissions management platform. The Azure-based platform is designed to measure baseline methane emissions from across Duke's natural gas distribution systems. Near-real-time data collection, advanced detection and tracking tools, and new sensor technologies are coming together to enable the energy company's field response teams to identify and repair methane leaks.

**“The current industry standard uses calculated data to report methane emissions, which leaves room for inaccuracies when it comes to actual methane levels. [Our new] platform will re-imagine how natural gas local distribution companies calculate methane emissions and perform leak surveys and improve the expediency in which leaks may be repaired, resulting in dramatically lower methane emissions.”<sup>14</sup>**

### **Brian Weisker**

Senior Vice President and Chief Operations Officer, Natural Gas at Duke Energy



# Where do we go from here?

With incentives, value models and digital platforms becoming increasingly available, energy companies have the tools they need to affordably and accurately measure their methane footprints, gain greater visibility and insights to inform their mitigation strategies and take decisive action.

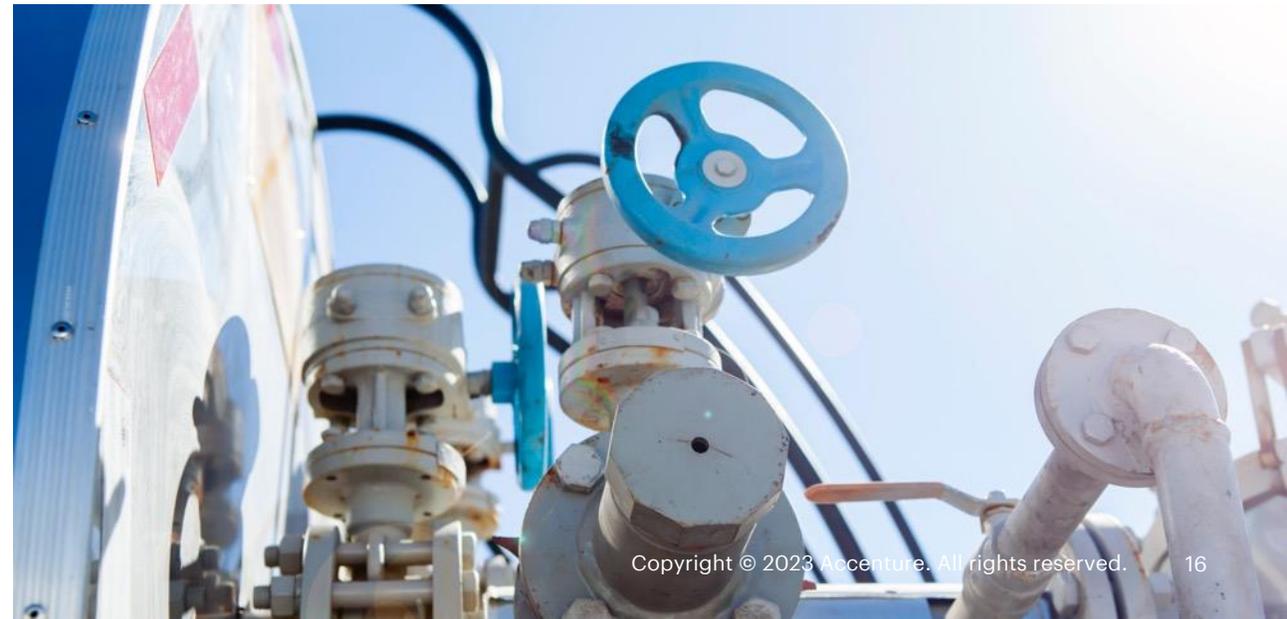
We believe recent breakthroughs have unlocked three opportunities that companies should pursue next.

# Deploy multi-modal, fit-for-purpose detection systems

Solving for the methane challenge starts with appropriately monitoring assets across the natural gas value chain to establish a clear baseline for methane emissions. Companies have made progress in this area. However, detection solutions have remained siloed and geared to solve for specific use cases.

Today, energy companies have the opportunity to integrate the best detection technologies to create a more realistic picture of their emissions and set more realistic targets. New digital platforms, such as Accenture's Methane Emissions Monitoring Platform, can automatically process large volumes of structured and unstructured data. That data can then be fed into a set of algorithms that qualify and prioritize their leak investigations.

Importantly, one size does not fit all. Companies need, therefore, to invest in digital platforms that can accommodate different combinations of technologies to meet their specific needs—from offshore to onshore, upstream to downstream and across the value chain.



# Infuse methane insights into business operations

Companies will need to ensure that the methane agenda is part of day-to-day workflows at all levels — from field technicians to asset managers to the C-suite and getting an accurate, 360° view of methane emissions across operations, and at an affordable cost is critical.

Businesses that become ‘methane intelligent’ will give leaders clear, actionable direction based on combined operational, financial, methane performance and safety data. These data insights will also inform the broader net-zero and ESG agendas, including business operations progress and skills requirements.



# Design for a zero-methane future

The best way to prevent emissions is to ensure that equipment and operating practices are designed to limit or eliminate the possibility of methane emissions in the first place. This applies to greenfield developments, as well as existing facilities and infrastructures.

Some industry leaders are starting to retrofit legacy assets. This is a more expensive route. But it is increasingly necessary. As standards tighten around methane management, energy companies should align to a zero-methane ambition.

One way to do so is through a zero-based transformation, which doesn't rely on the past to chart the future. Instead, it takes a holistic, "clean sheet" approach to rethinking costs and resource allocations. A zero-based transformation can help energy companies reimagine their business as a net-zero leader, reset their cost base and free up investments for the new methane-mitigation priority.

Recent Accenture research shows that a [zero-based transformation](#) can help embed sustainability into the business. Companies that adopt such an approach can reimagine what is possible by quantifying the cost of their decisions to the planet and society. By looking at costs through an ESG lens and sharing subsequent insights, companies can take a critical step in empowering their employees to support sustainability as part of their day-to-day responsibilities.

**“Being sustainable doesn’t have to cost more—and, indeed, it can lower costs and risks for companies.”**

**[Zero-based transformation: The big reset](#), Accenture, 2022**

# Seizing the methane moment

Methane emissions management is becoming and will remain a critical part of energy companies' clean energy future. Managing methane is already enabling the energy transition (and, specifically, the shift to gas as a transition fuel). The industry only has five to 10 years to transform. This will not be easy. But the energy industry has, time and again, made the impossible possible.

By harnessing the power of digital technologies, incentives and value models, a zero-methane emission future is within our grasp.

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## About Accenture

Accenture is a leading global professional services company that helps the world's leading businesses, governments and other organizations build their digital core, optimize their operations, accelerate revenue growth and enhance citizen services—creating tangible value at speed and scale. We are a talent and innovation led company with 738,000 people serving clients in more than 120 countries. Technology is at the core of change today, and we are one of the world's leaders in helping drive that change, with strong ecosystem relationships. We combine our strength in technology with unmatched industry experience, functional expertise and global delivery capability. We are uniquely able to deliver tangible outcomes because of our broad range of services, solutions and assets across Strategy & Consulting, Technology, Operations, Industry X and Accenture Song. These capabilities, together with our culture of shared success and commitment to creating 360° value, enable us to help our clients succeed and build trusted, lasting relationships. We measure our success by the 360° value we create for our clients, each other, our shareholders, partners and communities. Visit us at [accenture.com](https://www.accenture.com).

## About the Oil and Gas Climate Initiative: Aiming for Zero

The Oil and Gas Climate Initiative launched Aiming for Zero in 2022. Aiming for Zero is a growing oil industry effort to eliminate methane emissions from operations as soon as 2030, establishing an all-in approach that treats methane emissions as seriously as the oil and gas industry already treats safety: aiming for zero and striving to do what is needed to get there.

Support for the initiative has grown quickly. More than 80 companies, including major oil and gas companies, national oil companies and service companies and consultancies, have already joined and that number is growing.

OGCI is a CEO-led organization bringing together 12 of the world's largest energy companies to lead the oil and gas industry's response to climate change. The group aims to accelerate collective action toward a net-zero emissions future consistent with the Paris Agreement.

Aiming for Zero supplements several other multi-stakeholder initiatives to drive down methane emissions, including the Methane Guiding Principles, the Oil and Gas Methane Partnership 2.0 and the Global Methane Alliance.

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