

# ANNUAL REPORT 2025

Expanding  
**Industry Progress**  
through **Collective**  
**Work and Knowledge**



## OUR **MISSION**

To continuously improve the industry's environmental performance by **taking action, learning about best practices and technologies, and fostering collaboration to responsibly develop** our nation's essential oil and natural gas resources.





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# JOINT MESSAGE

## FROM CHAIRS AND DIRECTOR

**The Environmental Partnership (TEP) participants continue to make significant progress and remain committed to reducing emissions.** From the beginning, participants have committed to reducing emissions within their operations through innovative facility design, improvements in operational practices and procedures, advancements in detecting and measuring emissions, and improved accuracy in data emissions reporting.

The Partnership was formed in 2017 to provide a **space for operators to learn from one another about methane reduction solutions and strategies and to leverage that collective knowledge to improve the industry's environmental performance.** Our membership represents a diverse range of companies and includes small and large operators within and across multiple oil and natural gas segments. This diversity of perspectives contributes significantly to the robust operator-to-operator sharing that is at the heart of The Partnership's three principles of learning, collaborating and taking action.

Reducing methane emissions is a complex puzzle with many pieces, and each puzzle is unique to an individual operator's makeup. **There is not "a one size fits all" solution.** Companies implement different methane mitigation approaches and strategies based on basin and regional characteristics, types of assets, company size, and the company's individual emissions reduction goals. TEP helps participating companies navigate the wide range of solutions, make informed decisions on solutions that work best for their operations, and successfully assemble their unique methane reduction puzzle.





**Industry's success can be seen in the EPA's Greenhouse Gas Reporting Program that shows that methane emissions from U.S. onshore oil & natural gas fell by 42% between 2015-2023.** This reduction progress is owed to the ingenuity, creativity, and know-how of many of the individuals at our participating companies who have worked tirelessly to identify solutions and volunteer to share their expertise with others. Their ingenuity and commitment to tackling emissions are apparent in the **Industry Spotlights** highlighted throughout this report.

Each year, our annual report provides TEP with the opportunity to reflect on the achievements and advancements made since 2017 its start in and also to look towards the future and consider how we can better **support our membership as they work to meet the dual challenge of increasing energy production while forging ahead on environmental progress.**

Once again, participants made great strides across TEP's environmental performance programs and took steps to advance best practices to reduce emissions. Through TEP's Leak Detection and Repair Performance Program reporting, we see that **TEP companies are doing more** – using more detection technologies, inspecting more sites and facilities, and conducting inspections more frequently – and when they find a leak, they are fixing them faster. **Companies inspected over 199,000 sites, two-thirds of which were monitored voluntarily beyond regulatory requirements.** And similarly, TEP's 2024 flare study highlighted operator attentiveness in flare maintenance and performance to reduce emissions, showing that **for the flares tested, 88.95% were above 98% destruction and removal efficiency (DRE) and 99.45% were above 95% DRE.**

We are proud of the significant work our members have accomplished towards supporting emissions reduction progress and advancing environmental solutions. Although solutions may vary company to company, the one constant is that TEP participating companies are all **committed to working together to responsibly develop our nation's essential oil and natural gas resources while continuing to enhance environmental performance.**

**Sincerely,**



**VANESSA RYAN**  
*Chair, Chevron*



**ANGELA ZIVKOVICH**  
*Chair, Occidental*



**JONATHAN MATT**  
*Chair, MPLX*



**EMILY HAGUE**  
*Director, The Environmental Partnership*





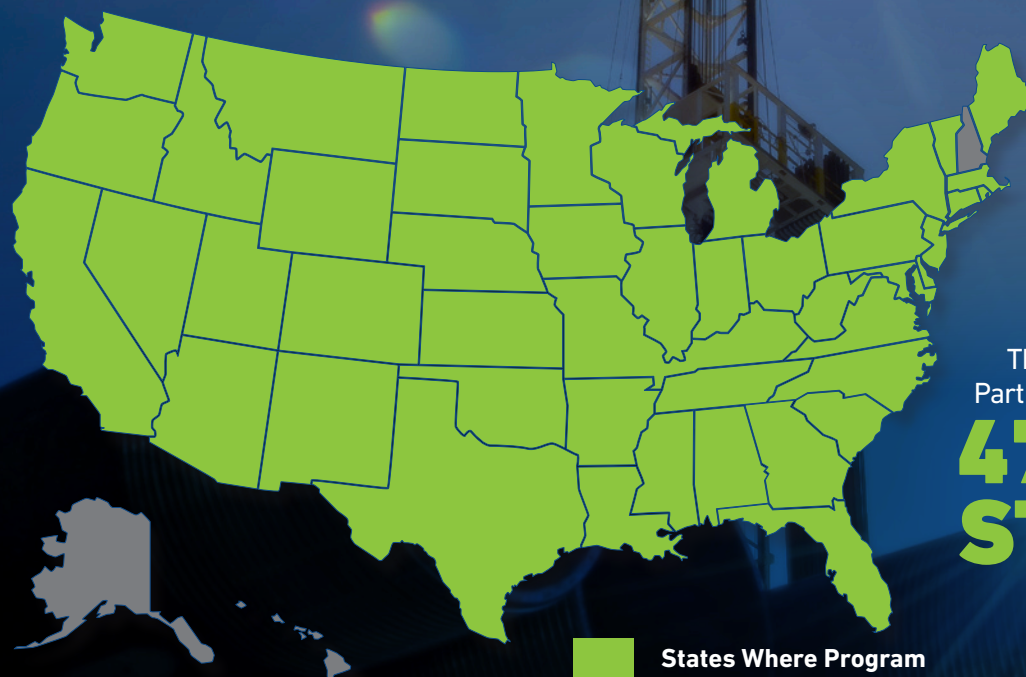
# 2024 PARTICIPATING COMPANIES







# IMPROVING OPERATIONS FROM COAST TO COAST



## PARTICIPATING COMPANIES

represent nearly

# 65%

of U.S. onshore oil  
and natural gas  
production

The Environmental  
Partnership is at work in

# 47 of 50 STATES



States Where Program  
is Implemented





## ENHANCING LDAR PRACTICES

As a Permian exploration and production company headquartered in Midland, Elevation Resources LLC is committed to taking care of the environment that we live in and is dedicated to the responsible, safe, and sustainable development of oil and gas. Regardless of the regulatory landscape, environmental stewardship is a key element to maintaining our license to operate. Elevation Resources has taken action on easily mitigated emissions sources to further minimize our GHG emissions and now is tackling the more difficult sources with technical expertise and operational efficiency.

One area where Elevation has focused its efforts is implementing practices that go a step further than required leak detection and repair (LDAR) monitoring requirements. Staff have increased their usage of in-house OGI cameras on battery builds and upgrades and sizing equipment to help them identify emission sources and where there is room for growth. Facility upgrades to improve flare (DRE) and rerouting gas within a battery could not have been made without the countless boots on the ground from our field team and engineers and the use of OGI cameras and methane sensors.

We are proud of the steps taken by our team to lower emissions and believe that as an industry, we are a lot stronger together than we are separated. We recognize the importance of sharing emission reduction solutions across the industry and in particular, with smaller independent companies. A given well is not a big emitter, but when you aggregate it, it's significant. Through Elevation's participation in industry organizations like The Partnership, we are working to expand and share our knowledge as well as find ways to make emissions solutions like monitoring technologies and LDAR practices accessible to all so that smaller operators can continue to produce.



**“Joining The Environmental Partnership allowed Elevation to deepen our technical knowledge and provided an important forum for bringing our industry together to collaborate and learn from each other.**

**The knowledge repository on the Partnership’s Participant Resources website and the wealth of information shared throughout the TEP workshops are integral to our continued enhancement of LDAR practices, as we work to continue to become cleaner every day.**

**Through deploying fence line monitoring and point sensors in our centralized asset, we’ve been able to notice trends and make decisions based on real data.”**

**— KODIE OCHOA**  
Petroleum Engineer  
Elevation Resources



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# COMMITMENT TO **ADVANCING ENVIRONMENTAL SOLUTIONS**

**TEP participating companies remain committed to advancing emission reduction solutions within their organizations.** Their commitment to TEP's three principles of learning through the sharing of best practices, collaborating with other experts to further industry understanding, and empowering companies to take actions that accelerate environmental progress has never been stronger. Through changing regulations and developing technologies, working together to identify and implement innovations and practices that reduce methane emissions is the way our participating companies do business.

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## THE ENVIRONMENTAL PARTNERSHIP **PRINCIPLES**



### **LEARN**

Participants commit to **continuously learning about the latest industry best practices and innovations** to help further reduce their environmental footprint while safely and responsibly growing energy production.



### **COLLABORATE**

Participants commit to **collaborating with one another and with academics, researchers and regulators** on the best strategies, tools and tactics to improve environmental performance.



### **TAKE ACTION**

Participants commit to **taking action to improve their environmental performance** through programs that can be implemented and phased into their operations.



## EMPOWERING OUR WORKFORCE TO DRIVE METHANE INTENSITY REDUCTION

Since launching our Focus on Methane initiative in 2019, MPLX NG&NGL Services has made methane reduction a strategic priority that we believe helps us achieve our ultimate goal of safe, compliant, and reliable operations. Our goal remains unchanged: reduce methane intensity by 75% by 2030. Through 2024, we've achieved a 59% reduction.

### Why Learning Matters More Than Ever

The playing field has shifted since we set our original goal. Global regulatory pressures are evolving, requiring stronger monitoring, more transparent reporting, and faster action on release events.

Meanwhile, ever-improving technology has enhanced our ability to detect and measure methane emissions. But tools alone aren't enough. Achieving our goals depends on everyone understanding how they can contribute.

### Culture Complements Strategy: The Methane Matters Campaign

In 2025, we launched an employee awareness and engagement program called Methane Matters that builds on our original Focus on Methane initiative. Methane Matters equips employees with knowledge, tools, and confidence to support our intensity reduction goal. We recognized that this cultural engagement would be essential to our future success. Strategy based on technology capabilities alone won't get us to 75%.

Like our safety approach, Methane Matters emphasizes practical, recurring learning. It reflects input from across job functions to refine strategies and spark better questions. We believe our best ideas come from the field and are built from shared understanding.

### Key Elements of our Methane Matters program

#### ACCESSIBLE CONTENT:

Our dedicated webpage features short, relevant, and engaging resources.

#### TEAM DISCUSSIONS:

Supervisors facilitate topic-based conversations to encourage peer learning and accountability.

#### DEEPER LEARNING PATHWAYS:

Role-specific tools and resources guide employees to expand their knowledge.



**Methane  
reduction is  
everyone's  
responsibility.**

**Methane  
Matters  
connects daily  
actions to our  
broader goals,  
empowering  
our workforce  
to create  
lasting results.**

**Together,  
we can turn  
awareness  
into action,  
and action into  
lasting results.**





# ENVIRONMENTAL PERFORMANCE PROGRAMS

**Our performance programs drive reductions in emissions. They provide an operating pathway to accelerate environmental improvement while creating support for regulatory obligations.**

**TEP has SIX ENVIRONMENTAL PERFORMANCE PROGRAMS<sup>1</sup>** that oil and natural gas production, processing and transmission companies can implement within their operations. These programs provide formalized reductions that can be broadly applied within operations, but this list is not all encompassing. In addition to the TEP programs, there are many other fit-for-purpose mitigation measures companies are taking to target emission reductions. Below is a summary of each of the six TEP programs.

## LEAK DETECTION AND REPAIR PROGRAM

Leak monitoring using detection methods and technologies including portable analyzers, optical gas imaging cameras, and laser-based aerial surveys, followed by timely repair.

## COMPRESSOR PROGRAM

Implement reduction practices that minimize emissions associated with centrifugal and reciprocating compressors – including routing vapors to control or replacing rod packings.

## PIPELINE BLOWDOWN PROGRAM

Implement reduction practices to minimize emissions during pipeline blowdowns – including routing natural gas to a low-pressure system or reducing pressure.

## FLARE MANAGEMENT PROGRAM

Implement practices to reduce flare volumes, promote beneficial use of associated gas and calculate flare intensity to demonstrate progress.

## MAINTENANCE AND INTEGRITY PROGRAM

Best practices that improve liquid petroleum pipeline and facility integrity and maintenance programs to reduce emissions and product releases to the environment.

## ENERGY EFFICIENCIES PROGRAM

Implement best practices to reduce energy consumption for liquid petroleum pipelines and facilities within the transmission and storage segments.

<sup>1</sup> TEP sunset its Pneumatics Controller and Manual Liquids Unloading programs in 2024 as those practices have become more routine within industry operations and have been incorporated into recent EPA rulemakings as workable solutions to reduce emissions.



CHEVRON

## **TACKLING METHANE EMISSIONS FROM PNEUMATIC CONTROLLERS**

A major component of remote, automated control of oil and natural gas industry facilities is the operation of control valves. These valves have historically been powered or actuated by natural gas through pneumatic controllers that release small amounts of methane and volatile organic compounds (VOCs) into the atmosphere. Converting natural gas-driven pneumatics to non-gas driven alternatives was recognized by TEP members as one of the best, voluntary actions companies could take to reduce their methane emissions when TEP launched in 2017.

As a founding member of TEP, Chevron's collaboration with Kathairos Solutions to reduce pneumatic emissions embodies the TEP principles of taking action on methane mitigation solutions and then sharing these solution learnings with other operators at TEP workshops and other networking events.

Chevron has extensive operations within the Denver-Julesburg basin covering a vast geographic area and supporting the production of over 400,000 barrels of oil equivalent per day. Kathairos helped Chevron execute their largest methane emissions reduction project of 2024 in Colorado. Over the course of a few months, Kathairos delivered and installed cryogenic liquid nitrogen tank technology at over 250 Chevron sites, converting over 5,500 gas-driven pneumatic devices to a non-gas driven solution.

Chevron's journey toward a lower carbon future is a narrative of action through trialing technologies in its operations, working with partners to advance measurement and mitigation tools, and sharing best practices with industry. The integration of Kathairos' technology into Chevron's Colorado operations is just one such testament to how TEP operators take action with innovative technology to reduce their methane emissions.



**"It's very simple. You're taking methane out of the pneumatics. So, you get essentially 100% reduction from methane emissions from those pneumatics.**

**And then the turnkey nature of the project made it something we could deploy across our operations."**

**— JONATHAN POMERANTZ**  
Senior Facilities Engineer  
Chevron



# EMPOWERING ACTION

## THROUGH COLLECTIVE WORK AND KNOWLEDGE

**The Partnership was established with the aim of facilitating sharing of operational learnings and solutions that reduce methane emissions.** TEP helps to expand individual company progress through collective research efforts targeting current emissions challenges and opportunities. Below are some of the key projects TEP organized last year to leverage members' ingenuity, creativity, and experience, to deliver actionable data and learnings.

The information provided from the projects enables companies to make more informed decisions that are fit for their unique operations and emission reduction goals.

- ✓ **ADVANCING EMISSIONS DETECTION AND MONITORING PRACTICES**
- ✓ **PROMOTING FLARE EFFICIENCY PRACTICES**
- ✓ **LEVERAGING OPERATIONAL PARAMETERS TO IDENTIFY AND PREDICT EMISSION EVENTS**
- ✓ **EXPANDING COMPRESSOR KNOWLEDGE THROUGH COLLECTIVE DATA ANALYSIS**





# ADVANCING EMISSIONS DETECTION AND MONITORING PRACTICES

**Since TEP's start, participants have worked hard to implement robust leak detection and repair (LDAR) programs within their organizations to find and fix unintentional emissions from equipment as soon as possible.**

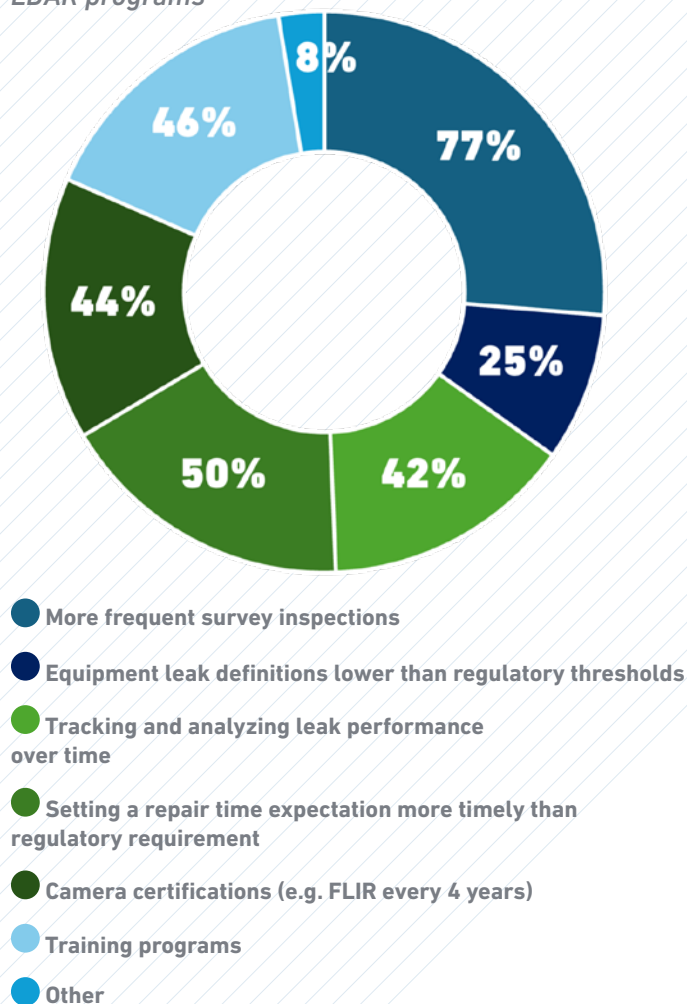
Last year, TEP redesigned its LDAR Environmental Performance Program to better align with current industry practices and fully capture the advancements companies have made in the past eight years to detect, monitor, and prevent leaks from occurring within their operations.

The updated performance program, included within this year's annual reporting, asks participants to implement one or more LDAR program enhancements beyond regulatory requirements. LDAR program enhancements may include more frequent survey inspections than regulatory required, using alternative monitoring technologies, setting a repair time that is more timely than regulatory required, tracking and analyzing leak performance over time, and other activities implemented with the intent to find and fix leaks as fast as possible. *(Figure 1)*

Detection technologies include laser absorption spectroscopy, optical gas imaging, and sensors. While continuing to implement established ground-based monitoring approaches, many TEP members are incorporating aerial-based monitoring approaches with drones, airplanes, and space-based monitoring through

**FIGURE 1**  
**TEP LDAR PROGRAM ENHANCEMENTS**

*How TEP companies are enhancing their LDAR programs*





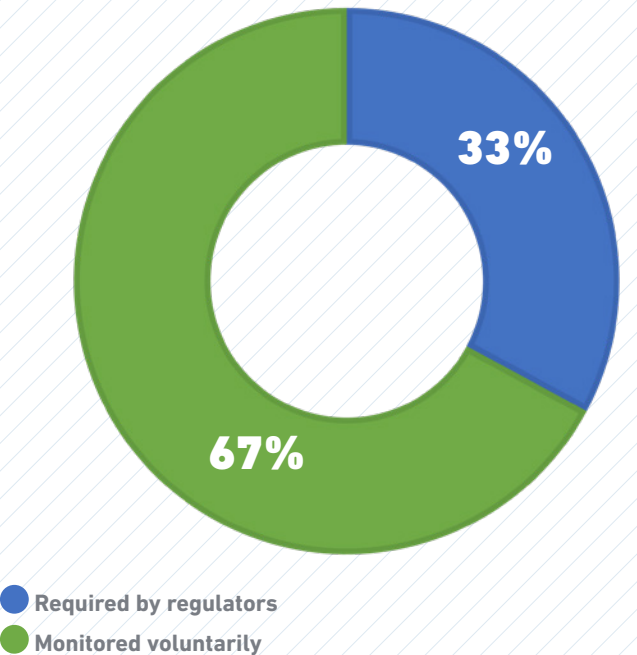
satellites. Additionally, companies are identifying ways that operational information can be used to predict, prevent, and report emissions sources more accurately.

In 2024, more than two-thirds of the reported sites monitored were conducted voluntarily (Figure 2) and aerial-based monitoring technologies were used on over 48% of these sites. These concerted efforts to find, fix and prevent leaks have resulted in a significant reduction in the annual leak occurrence rate reported by TEP members. Participants reported a leak occurrence rate of just 0.02% for 2024, or less than one component leaking in 1,000. (Figure 3) TEP members also reported an estimated annual meantime to repair leaks of 10 days – a significantly lower number than the federal requirement to fix leaks within 30 days.

There are a variety of ways companies are working to identify emission leaks, and the right option can vary across sectors with different types of assets. But the key takeaway from TEP program reporting is that our participating companies are doing more – using more detection technologies, inspecting more sites and facilities, and conducting inspections more frequently – and when they find a leak, they are fixing them faster.

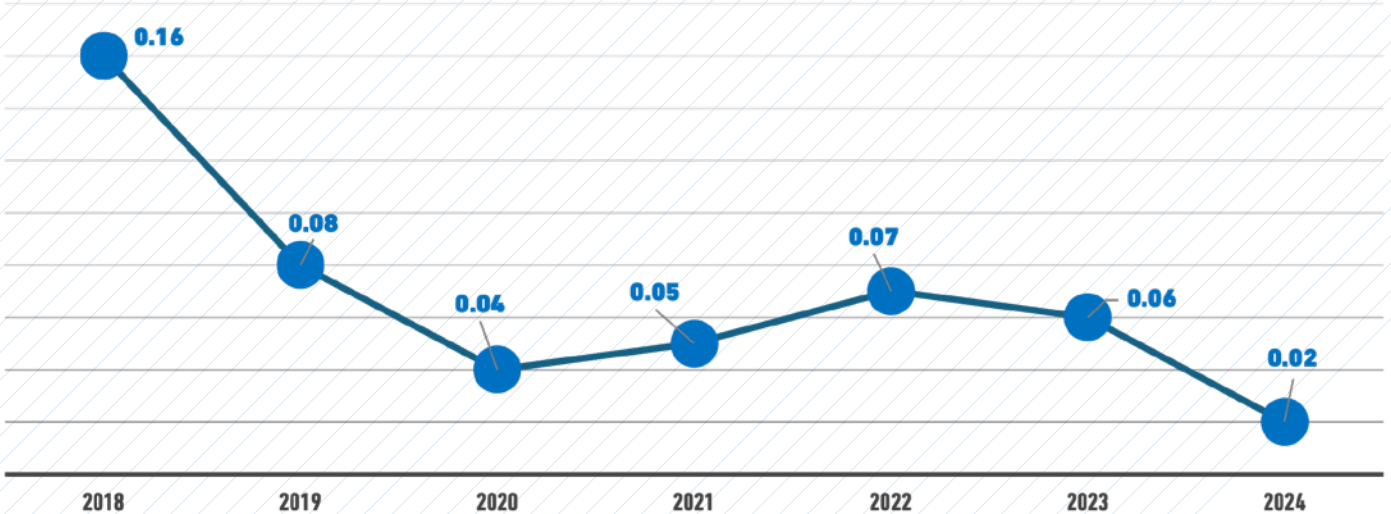
**FIGURE 2**  
**NUMBER OF SITES MONITORED IN 2024**

*The reported number of sites monitored by TEP companies in 2024 regulatorily and voluntarily.*



**FIGURE 3**  
**ANNUAL REPORTED LEAK OCCURRENCE RATE**

*Percentage leak occurrence rate: Number of devices or components found leaking for total number of devices or components surveyed.*



# BUILDING A COMPREHENSIVE LDAR PROGRAM

In the Appalachian basin, PennEnergy Resources takes a proactive and thoughtful approach towards reducing emissions through its Air Quality & Sustainability program. A key element of this program is the comprehensive leak detection and repair (LDAR) program, which monitors all facilities for fugitive leaks via multiple technologies (with prompt, predominantly same-day repairs) and goes well beyond the basic regulatory requirements.

## Enhanced Leak Detection and Repair

### *Optical Gas Imaging (OGI) Inspections*

On a monthly basis, PennEnergy conducts OGI camera inspections – triple the frequency required under current regulation. OGI cameras are the cornerstone of the LDAR program, and the most sensitive detection tool employed.

### *Audio, Visual, and Olfactory (AVO) Inspections*

On a weekly basis, PennEnergy conducts AVO inspections – quadruple the frequency required under current regulation. AVO leaks are detected using senses (sound, sight and smell) by operators familiar with the facilities to frequently hone in on potential leaks.

### *3rd Party Flyovers*

In addition to boots-on-the-ground inspections, voluntary aerial inspections are conducted by contractors to detect potential anomalous emissions from above on an annual basis.

### *Emissions Quantification*

Beginning in 2024, PennEnergy began quantifying leaks with a precision methane analyzer. Based on the current comprehensive dataset, PennEnergy has found that its fugitive emissions profile is significantly less than what would be calculated using conventional emissions factors.



“PennEnergy strongly believes that minimizing emissions is a responsibility of upstream oil and gas companies.

Through our robust LDAR program, along with several other proactive air programs in place, PennEnergy strives to not only meet or exceed all environmental regulatory requirements but also continually reduce emissions from our operations.”

### – DOMENIC TEDESCO

Director, Air Quality  
& Sustainability  
PennEnergy





# PROMOTING FLARE EFFICIENCY PRACTICES

**TEP companies have made significant progress in reducing overall flare volumes since TEP's flare management program was launched in 2020.**

Last year, The Partnership conducted a study to better understand and promote flare efficiency and reliability best practices for times when flaring is necessary. Flaring typically occurs when there is a lack of takeaway or processing capacity, during facility or downstream facility maintenance, or during unplanned events that may require flaring to safely alleviate pressure. In these instances, flaring is better for the environment than venting the gas directly into the air because it releases fewer greenhouse gases.

The study focused on flare destruction and removal efficiency (DRE) to better understand what DRE can be achieved and what factors might affect DRE. It involved four weeks of testing in three basins (Eagle Ford, Permian, and Bakken), coordinating with 11 operator partners and evaluating over 180 flares from 13 manufacturers. Enclosed combustion devices were not included in this study.



Commercially available VISR (Video Imaging Spectral Radiometry) and Simplified VISR technology were selected for DRE measurements to attempt to identify practices that lead to good performance. VISR and Simplified VISR both measure flare performance metrics at 1-second intervals including smoke index (visible emissions; an alternative to EPA Method 22 or Method 9), fractional heat release (flare gas flowrate), presence or absence of pilot flame, flame thermal footprint, and flame stability. They also directly measure flare combustion efficiency (CE) with established methodology to derive a DRE measurement utilizing established correlations between CE and DRE.



Providence Photonics VISR Technology

## // STUDY RESULTS

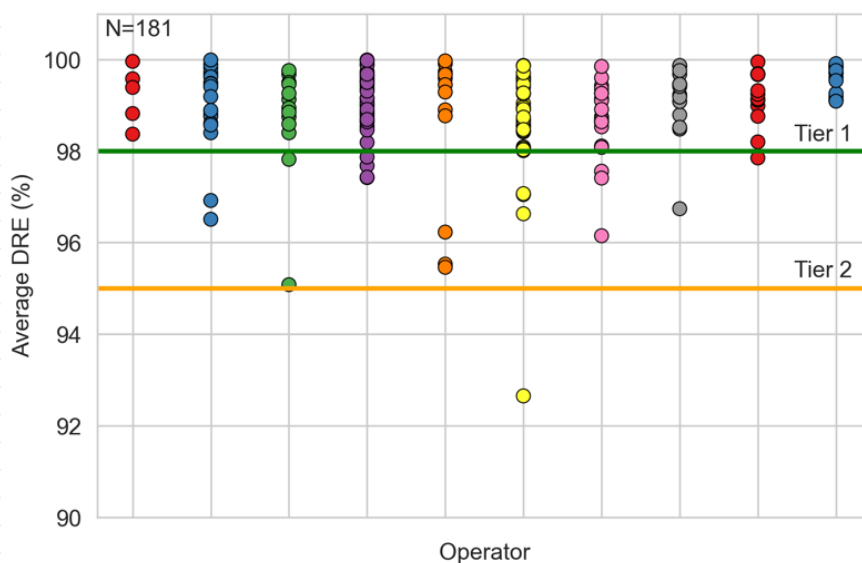
Results from the VISR DRE data showed that 89% of the normally operated flares tested were above 98% DRE, 99% were above 95% DRE, and 100% met the 92% DRE threshold. (Figure 4). These results suggest that using EPA's default tier categorization for calculating emissions from flares may overestimate emissions.

In the Bakken basin, 89% of flares tested during normal operations were above the 98% DRE threshold with an additional 10% above the 95% DRE threshold. In the Eagle Ford and Permian basins combined<sup>2</sup>, 88% of flares tested during normal operations met the 98% DRE threshold and all flares exceeded the 95% DRE threshold.

FIGURE 4

### VISR DRE MEASUREMENTS

*VISR DRE measurements by anonymized operator for normal operations testing; illustrating "EPA Greenhouse Gas Reporting Subpart W flare tier categorization (40 CFR 98)"*



<sup>2</sup> Basins were combined to ensure operator anonymity.

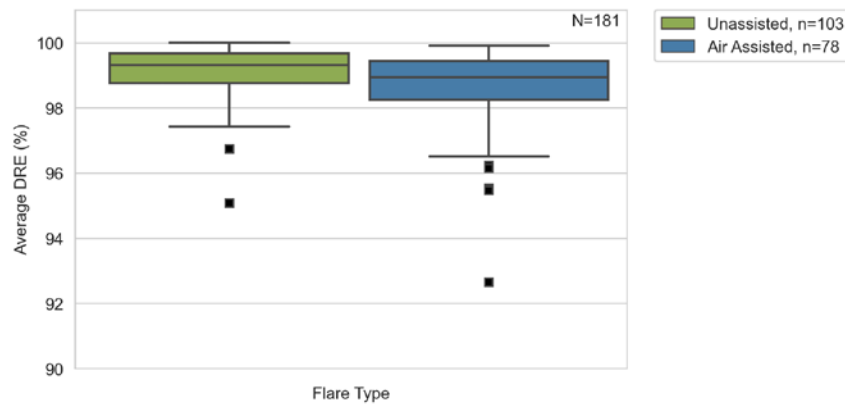


Flare installation date did not appear to play a significant role in DRE results. Results also showed minimal difference between flare types and average DRE.(Figure 5).

FIGURE 5

## VISR DRE BY FLARE TYPE

*VISR DRE (%) with respect to flare type (air assisted, unassisted) for normal operations testing*



TEP participants are committed to better understanding the flare operation adjustments necessary to achieve optimal flare performance. Additionally, we will continue to work with manufacturers on flare designs that accomplish both lower opacity and high DRE results.

## // STUDY TAKEAWAYS

In addition to furthering participants' understanding of flare DRE, the study also identified the following best-practices solutions that study participants are implementing to ensure flaring efficiency:

- ✓ **Using a continuous pilot and/or an auto-ignitor, and in some cases having multiple pilots,**
- ✓ **Actively managing liquids in the vapor collection system (VCS),**
- ✓ **Monitoring flares with a thermocouple and including options such as an on-site security camera,**
- ✓ **Conducting daily visual inspections,**
- ✓ **Including the flare, pilot, VCS, and FA/DFA in a maintenance program, and**
- ✓ **Having alarms set to notify staff when a flare or flare pilot is down.**



## IMPLEMENTING TANKLESS DESIGN SOLUTIONS

One of our most transformative innovations is the tankless design, now implemented across many of our greenfield and brownfield battery projects. This design replaces traditional atmospheric storage tanks with pressurized surge vessels, maintaining similar process flows and liquid retention times. Surge vessels do not require high-risk pressure protection devices such as thief hatches and vent stacks. Instead, they utilize spring-loaded, bubble-tight pressure relief valves, significantly reducing the potential for emissions leaks. The design also directs gas flow from hung separator dumps to flare, not vent.

### EMISSIONS REDUCTION & PERFORMANCE GAINS

Our tankless design has delivered substantial environmental and operational benefits such as ~70% reduction in facility emissions, ~25% improvement in vapor capture efficiency over legacy designs, and significant reduction in methane release risk. These improvements reflect our commitment to proactive, data-driven solutions that address core emission sources.

### SCALABILITY & IMPLEMENTATION

In 2020, we transitioned all in-flight projects to the tankless design, bringing our first facility online in Q1 2021. Since then, we've commissioned over 50 tankless facilities, now covering approximately 60% of our oil production. Our designs have scaled to accommodate multiple leases, with facility capacities reaching 40,000 BOPD, 160,000 BOPD, and 180 MMSCFD. This scalability ensures operational efficiency across diverse production environments.

### REGULATORY ALIGNMENT & RISK MITIGATION

With new regulations, our tankless approach offers a strategic advantage. By eliminating these tanks, we've preemptively removed what would have become one of our top emission sources. These measures help avoid triggering 0000b Super-Emitter thresholds, reinforcing our commitment to responsible operations. With new regulations, our tankless approach offers a strategic advantage. By eliminating these tanks, we've preemptively removed what would have become one of our top emission sources. These measures help avoid triggering 0000b Super-Emitter thresholds, reinforcing our commitment to responsible operations.

### PROGRAM EXPANSION & FUTURE INNOVATIONS

Coterra continues to expand the tankless program to include low-producing, high-emission-risk facilities. We've developed smaller, cost-effective vertical surge vessels tailored for these sites, enabling broader adoption. Most recently, we've extended tankless solutions to our newest compressor stations, supporting natural gas liquid storage with the same emissions-reducing benefits.



**Our tankless design eliminates approximately 70% of the emissions at these facilities compared to atmospheric storage tanks and greatly reduces the risk of methane releases.**

**We also see around 25% more vapor capture efficiency than our historic storage tank designs.**



# LEVERAGING OPERATIONAL PARAMETERS TO **PREDICT & PREVENT EMISSION EVENTS**

**Many TEP operators are exploring how to use existing SCADA systems that collect, monitor, and control field operations remotely to predict, prevent, and report on emission events.**

For example, flow meters or changes in pressure, temperature, electricity, or wind can be monitored to optimize production or serve as a precursor to predict an emissions event. Operators have been collecting operational parameter data for a number of years, and through their ingenuity, have begun to look at the data to systematically prevent and respond faster to operational conditions which could result in emissions. Operational parameter data can also be used to constrain the duration of an operational upset or potentially be used to estimate volumes where process metering is available (e.g., unlit flare with a meter), to inform emissions reporting initiatives.

In 2024, The Partnership organized an effort to develop a performance practice on the use of operational parameters data and other operational

information to predict, prevent, and report emissions sources more accurately. TEP focused its project on the sources of emissions that are typically higher—namely tanks, flares and compressors.

Twelve operating companies, ranging from small private operators to major integrated corporations, shared their operating practices. This individual sharing was then compiled into a draft performance practice which was reviewed within appropriate TEP workgroups and further refined during an operational parameters monitoring panel discussion held at the Fall TEP Permian Basin workshop.

**This guidance is now available to all participants within TEP's online resources repository and serves as a tool to help TEP operators make more informed decisions on whether monitoring such parameters at existing facilities or as part of the design of new facilities is fit for purpose within their operations and emissions management practices.**

“TEP is a unique opportunity amongst the oil and natural gas industry to leverage a diverse range of operators all aimed at a like-minded goal. I appreciate the opportunity to support and work with TEP in synthesizing its membership's sometimes varied viewpoints into an impactful set of findings – such as the identification of emerging practices on operational parameter monitoring.”

– DR. ERIN TULLOS | Managing Member at Astra Energy Group



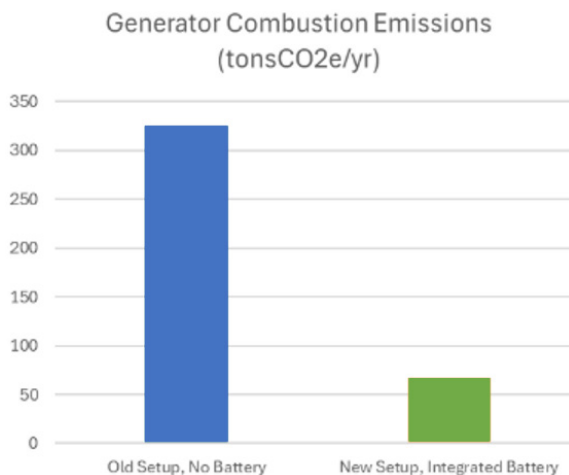


## DEVELOPING A HYBRID BATTERY-GENERATOR SYSTEM

In Colorado's Denver-Julesburg (DJ) Basin, Occidental's operations team faced the challenge of powering a remote oil production location without electric grid access and relied on a diesel generator to run operations. Due to varied equipment usage throughout the day, which created fluctuations in power demands, the generator operated continuously. This variability in load demand led to inefficiencies, which resulted in the generator frequently ramping up and down.

To address concerns with operational inefficiencies and associated emissions, a hybrid battery-generator system was designed and successfully implemented. The facility now operates on battery power, which can effectively manage fluctuating demands, and a generator powers the battery with significantly less runtime required. Occidental's operations team was able to downsize and upgrade to a more efficient model that uses Diesel Exhaust Fluid (DEF) in addition to diesel, which has reduced diesel usage and corresponding emissions by 79% annually.

The hybrid system operates efficiently with fewer runtime issues and is capable of charging during peak time or supplying energy based on peak demand charges. Furthermore, it functions as a surge protector, voltage regulator, and energy storage system, offering a wide range of applications.



**Occidental plans to deploy this hybrid battery-generator system at additional sites to help reduce emissions and increase operational efficiencies. Justin Delap oversees the Department of Efficiency for Occidental's Rockies operations and designed the hybrid battery system.**

"I am truly passionate and motivated about driving innovation in emerging technologies to reduce emissions and improve efficiency. Occidental constantly strives to innovate, enhance, and explore both existing and new opportunities, always seeking to make a positive impact."

— **JUSTIN DELAP**

Leader, Department of Efficiency/  
Operational Excellence  
Occidental



# EXPANDING COMPRESSOR KNOWLEDGE THROUGH COLLECTIVE DATA ANALYSIS

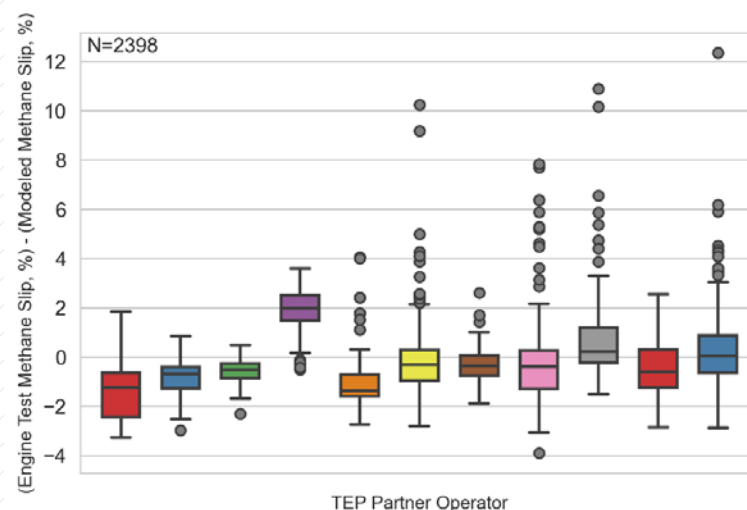
**TEP companies continue to work together towards step change-type actions and solutions to reduce emissions from compressors – particularly, compressor engine slip emissions.**

Last year, TEP conducted a compressor engine survey to analyze engine stack testing data provided by TEP operators. Stack testing is an important tool used to determine compliance with emission limits. Operators have been collecting stack testing data for a number of years, and TEP's project provided an opportunity to analyze a broad pool of data to further industry understanding of emissions sources within compressors and assist TEP participants in identifying solutions to reduce these emissions.

Eleven participating companies provided data for over three thousand engine tests. Data spanned a range of engine models, leasing companies, and basins. Methane slip percentage and destruction and removal efficiency (DRE) were calculated using a methodology established through a previous TEP-Colorado State University study. The difference between the actual and modeled methane slip results were plotted for analysis. (Figure 7). Outliers were noted and sent to participating companies for feedback, and final data plots provide a snapshot of field conditions and compressor performance across the industry.

**FIGURE 7  
ENGINE TEST METHANE SLIP**

*Results from the 2024 TEP Survey show the difference between the methane slip as provided by company test results and the methane slip modeled using either GERP or EngCalc5.0 as a function of anonymized participating company. A value of zero implies equivalence between the calculated and modeled methane slip percentage.*



**The analysis showed that operational practices to improve engine emissions can yield emission reductions, but the bulk of engine emissions may not easily be addressed by operational practices and may require manufacturers to address emissions through engine design or add-on controls.**

<sup>3</sup> See [TEP's 2023 Annual Report](#).

## ENHANCING METHANE MONITORING THROUGHOUT THE APPALACHIAN BASIN

Since January 2023, EQT has partnered with other leading U.S. natural gas companies to form the Appalachian Methane Initiative (AMI), a coalition dedicated to enhancing methane monitoring throughout the Appalachian Basin and driving additional methane emissions reductions across the region. AMI aims to improve the efficiency of identifying and addressing potential fugitive methane emissions from operations in the Appalachian Basin by conducting coordinated aerial surveys on a geographic-basis, as opposed to an operator-specific basis, and advance methane monitoring and reporting frameworks.

Following the successful completion of a pilot program in 2023, AMI was expanded in 2024 to utilize more than 15,000 aerial surveys across approximately 20,500 square miles of the Appalachian Basin to measure emissions from oil and gas operations as well as other sources, such as coal mines and landfills. In its March 2025 announcement of the 2024 monitoring program results, AMI determined that the Appalachian Basin has the lowest methane emissions intensity of any major oil and gas producing basin in the United States.

AMI is mid-way through the 2025 campaign and is on track to monitor more than 32,000 square miles of the Appalachian Basin, including gas production facilities with daily volumes roughly 100% of the daily production within the Appalachian Basin, which is a nearly sixfold increase in volume compared with surveys completed in 2023. The number of non-oil and gas sites surveyed, such as coal mines/vents and landfills, are also anticipated to increase.

We use this measurement and monitoring data to compare against emissions values calculated using emissions factors. These results also allow us to identify potential emissions reduction initiatives going forward. Further, we examine potential differences between emissions calculated using emissions factors and measurement or monitoring approaches to determine the best method to prepare annual emissions inventories in the future.



**“Our participation in TEP’s aerial flyover study initiative conducted in 2021 and 2022 highlights the value of a collective approach to methane emissions detection, quantification and mitigation. By joining forces with other like-minded upstream and midstream operators in the Appalachian Basin, we are bringing greater transparency to the emissions profile of the Basin while also addressing fugitive methane emissions more effectively through coordinated aerial and satellite monitoring.”**

**— ALEX BOSILJEVAC**  
Senior Environmental  
Coordinator  
EQT



# DRIVING PROGRESS

## THROUGH LEARNING AND COLLABORATION

**Sharing best practices and solutions among peers and with other stakeholders who share the goals of reducing emissions and improving environmental performance is the cornerstone of The Partnership.**

Through our learning and collaboration principles, we drive positive change and industry improvement by providing members an opportunity to convene, learn, and share valuable information about new strategies and emerging technologies to reduce emissions. Many of the unique challenges that individual operators face are, in fact, solvable when tackled together through open dialogue with industry peers and other experts.



**REGIONAL WORKSHOPS**



**METEC OGI CAMERA TRAINING**



**ANNUAL MEETING, CONFERENCE  
AND TECHNOLOGY FORUM**





## // DRIVING PROGRESS THROUGH LEARNING AND COLLABORATION

### Accelerating Environmental Progress



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## // REGIONAL WORKSHOPS



**In 2024, TEP held three in-person workshops in the Appalachian, Bakken, and Permian Basin regions. These events brought together air quality company experts to promote sharing of operational learnings and solutions to reduce methane emissions and further our industry's progress toward improving environmental performance.**

The Appalachian Basin workshop focused on topics relevant to their basin-specific operations including produced water tank emissions and controls, pneumatic controller emissions solutions, compressor emissions characterization and liquid unloading practices.

The Bakken Workshop covered flare management, TEP research projects underway, emissions monitoring, drilling and completion strategies, pneumatic controllers, and more. The workshop also included a presentation on the iPIPE and flare projects underway at the University of North Dakota Energy & Environmental Research Center.

The Permian Basin Workshop brought together local operators representing 28 companies to discuss shared challenges and learn about ways to detect and drive down methane emissions. Company air and engineering experts discussed methane regulatory compliance challenges, compressor emissions solutions, and shared practices on how companies are using operational parameter data (SCADA, PI Tags, parametric data, pressure, temperatures, etc.) to predict, prevent, and report emissions more accurately. Staff from TCEQ's Air Permitting Division also provided a presentation covering the new federal methane regulations and next steps for how Texas will implement these standards into its State Implementation Plan.



## // METEC OGI CAMERA TRAINING



**In June 2024, TEP company representatives attended a two-day course at the Methane Emission Technology Evaluation Center (METEC) at Colorado State University, a long-standing partner of TEP.**

The optical gas imaging (OGI) camera training provided attendees with the opportunity to improve their methodology and performance through hands-on application, simulated leak detection and repair (LDAR) scenarios and direct feedback from METEC experts.

These events support TEP's key principle of collaboration – providing an opportunity for operators to share ideas, learning from subject matter experts, and expand their abilities in operational practices and technologies.

“Our continued partnership with TEP is invaluable given their ability to convene multiple industry partners to work on important issues. In 2024, we worked together to host a METEC OGI camera training for TEP operators and shared results of our basin-wide emission studies at TEP's Annual Meeting and Conference. TEP provides a bridge to a broad cross section of industry partners and perspectives, which is instrumental for CSU's multi-stakeholder work on leak detection solutions.”

– **TIM VAUGHN** | Research Scientist, Colorado State University





## // ANNUAL MEETING, CONFERENCE, AND TECHNOLOGY FORUM



**Wrapping up another productive year, more than 170 operators and industry stakeholders and partners attended The Environmental Partnership's 7th Annual Meeting and Conference in Houston in December.**

TEP participants discussed ways to evolve TEP programs to ensure that its performance actions continue to align with the key industry advancements as well as the evolution in methane-related regulations.

Attendees also shared strategies on how they are incorporating different monitoring technologies into their leak detection and repair programs to identify and prevent emissions and shared insights on the evolution of methane measurement studies to further understanding of methane emission sources and advance reconciliation between top-down and bottom-up methane emission estimates.

Held alongside the annual meeting, the technology forum featured exhibits from 20 industry partners, providing a chance for attendees to engage with a range of companies that are working with industry to implement innovative technologies to reduce emissions.



## IMPLEMENTING MANUAL LIQUID UNLOADING PRACTICES

Seneca Resources Company, LLC (Seneca), the upstream segment of National Fuel Gas Company (NFG), explores for and produces natural gas wells in the Appalachian Basin in Pennsylvania. Seneca has taken a proactive approach to emissions management, including setting a methane intensity reduction target, which can be explored further in our Corporate Responsibility Report available on National Fuel Gas Company's website.

Since joining The Environmental Partnership (TEP) in 2018, Seneca has committed to:

- **Implementing best practices to minimize emissions associated with removal of liquids that can build up and restrict gas flow as wells age;**
- **Conducting Leak Detection and Repair (LDAR) surveys, and promptly repairing on all active assets; and**
- **Replacing, removing, or retrofitting high-bleed pneumatic controllers.**

Recognizing the need to manage liquid unloading events, which can be a significant source of emissions as wells age, Seneca began tracking these events and implemented manual unloading practices for well management as a best practice recommended by TEP. The Seneca team also installed plunger lubricators as part of its wellhead design on new wells, allowing for minimized downtime and expedited plunger deployment when necessary.

Seneca continues to look for ways to optimize and improve strategies, technologies, and techniques for managing and mitigating well liquid unloading emissions. After trialing different technologies and operational best practices, Seneca's current strategy to mitigate manual well unloading events to atmosphere includes implementing well pressure builds (i.e., shut-in periods to allow for pressure increase), using capillary strings, installing plungers, and deploying mobile unloading compressors. These efforts have led to an 84% decrease in vented emissions from liquids unloading compared to our 2020 baseline. The Seneca team remains focused on identifying additional opportunities and design changes to further reduce and prevent emissions in this category.



**“What makes this achievement so remarkable is the ingenuity of our team—delivering impactful results through straightforward, thoughtful design changes that didn’t complicate operations.**

**By staying focused on practical solutions and acting quickly, we were able to dramatically reduce emissions and set a new standard for efficiency and environmental stewardship.”**

**— BRENDAN BURKE**

Vice President  
Production  
Seneca Resources



# 2024 PERFORMANCE HIGHLIGHTS



## LEAK DETECTION AND REPAIR PROGRAM

More than  
**658 million**  
component inspections performed

Over  
**678,000**  
surveys conducted

Over  
**199,000**  
sites surveyed

**0.02%**  
leak occurrence rate,  
or less than 1 component leaking in a thousand

## MAINTENANCE AND INTEGRITY PROGRAM

More than  
**24,300**  
preventative maintenance activities completed for  
over 37,700 miles of liquid pipelines

Over  
**3,500**  
preventative maintenance activities completed for  
liquid pipeline-associated facilities

Over  
**17,350**  
miles of liquid pipeline inspected  
with inline inspection tools

## PIPELINE BLOWDOWN PROGRAM

Emissions Reduction Practices implemented during more than

**10,400**  
pipeline blowdowns

## COMPRESSOR PROGRAM

Rod packing changes on more than

**3,600**  
reciprocating compressors

Approved emissions reduction practices utilized on more than

**1,100**  
compressors

Over  
**275**  
compressor engines replaced with or installed  
with electric motors

## ENERGY EFFICIENCIES IN OPERATIONS PROGRAM

More than  
**1,175**  
liquid pipeline-associated facilities applied or considered  
energy reduction methods





# ACCELERATING PROGRESS YEAR-OVER-YEAR

2018 - 2024

**LEAK DETECTION  
AND REPAIR**  
PROGRAM

More than

**1.8 billion**  
component inspections performed

More than

**3.2 million**  
surveys conducted

2020 - 2024

**PIPELINE BLOWDOWN**  
PROGRAM

Emissions reduction practices  
implemented during more than

**26,400**  
pipeline blowdowns

2020 - 2024

**COMPRESSOR**  
PROGRAM

Rod packing changes on more than

**18,000**  
reciprocating compressors

Approved emissions reduction  
practices utilized on more than

**4,400**  
compressors





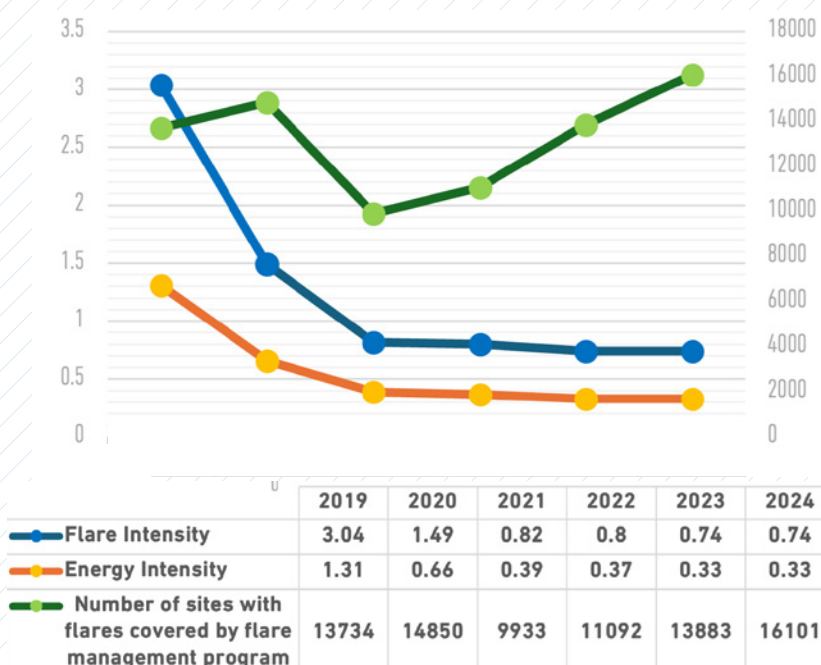
# MAINTAINING FLARE MANAGEMENT PROGRESS

**TEP and its members are committed to reducing flaring by advancing best practices, promoting the beneficial use of associated gas, and improving flare reliability and efficiency when flaring is necessary.**

Typically, high-pressure flares are used when there is a lack of natural gas gathering lines or processing capacity, during facility or downstream facility maintenance, or during unplanned events that may require flaring to safely alleviate pressure. In these instances, flaring is better for the environment than venting the gas directly into the air because it releases fewer greenhouse gases. To track progress, participants in the program annually report data to calculate flare intensity, a measurement of flare volumes relative to production.

In 2024, participating companies maintained its significant progress made in reducing overall flare volumes by more than 75% since TEP's flare management program was launched in 2020. (Figure 8) Reported flare and energy intensities remained flat even as companies increased the number of sites included within the program by over 16% from last year and over 62% since 2021.

**FIGURE 8  
PARTICIPATING COMPANY FLARE INTENSITY  
YEAR OVER YEAR**



\* Gas Flare Intensity — Flaring relative to gas production in oil fields (MCF gas flared / MCF gas produced)

\*\* Energy Intensity — Flaring relative to oil and gas production (BOE gas flared / BOE produced)



## FLARING REDUCTION PRACTICES TO ACHIEVE EMISSIONS REDUCTION GOALS

Hess is proud to be among the first companies to join The Environmental Partnership. The company's implementation of the Flare Management Program in its North Dakota operations has notably reduced flaring and contributed to Hess' broader emissions reduction goals.

In partnership with Hess Midstream, Hess continues to focus on the buildout of gas infrastructure in the Bakken while at the same time adjusting its operating practices and facility design to reduce flaring. Over the past 13 years, more than \$3.8 billion (gross) has been spent on midstream infrastructure in North Dakota, supporting Hess' strong performance over the past several years. Hess Midstream is continuing to execute capital projects to increase natural gas capture rates, which provides economic returns through the sale of the additional natural gas and natural gas liquids captured.

These efforts, combined with the completed phaseout of known high bleed pneumatic controllers in 2021 and continued implementation of the Hess and Hess Midstream leak detection and repair program, have supported notable reductions in flaring and methane emissions intensity in recent years.



In 2024, flaring from Hess' global operated assets fell to

**22.1M**  
standard cubic feet  
per day, a

**69%**  
decrease  
from 2019.

Hess' flaring intensity also improved, from

**201**  
standard cubic feet  
per BOE in 2019  
to 56 in 2024 – a

**72%**  
decrease



# 2025 ACKNOWLEDGEMENTS

We would like to thank the dedicated individuals who contribute to The Environmental Partnership's core mission of sharing learnings, including external partners who presented during workshops and collaborated on research and studies in 2024. We look forward to the future as we continue to welcome new companies and industry collaboration.

## // NEW PARTICIPANTS



## // PARTNERS



“Prairie Operating Co. LLC (“Prairie”) is dedicated to developing affordable, reliable energy to meet the world’s growing demand, while continuing to be environmentally mindful. As a small operator, Prairie finds immense value in being part of The Environmental Partnership. The collaboration provides access to industry expertise, innovative emissions solutions, and best practices that might otherwise be challenging to develop independently; thereby, enhancing our ability to implement operational strategies and deliver safe, environmentally responsible energy production.”

— MEREDITH KNAUF | Manager – Air Quality and Environment, Prairie Operating Company







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