MethaneTrack™

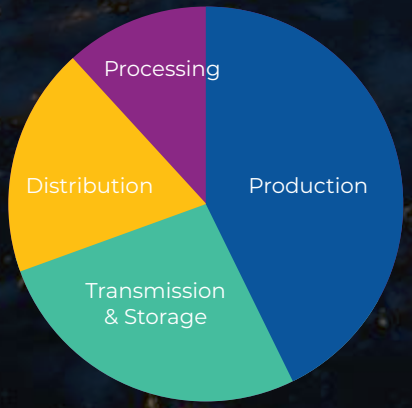
MethaneTrack™ is an automated emissions monitoring system that detects and identifies the location and size of methane and methane-blend leaks.

NevadaNano

Protecting People, Property, and Planet

About Methane

Methane is a potent greenhouse gas second only to carbon dioxide. However, on a 100-year timescale, methane has 28 times greater global warming potential than carbon dioxide, and is 84 times more potent on a 20-year timescale. Methane is responsible for about 30% of the rise in global temperature since the industrial revolution.



The energy sector was responsible for nearly 130 Mt of methane emissions in 2023 – more than one third of the total amount attributable to human activity and second only to agriculture (around 145 Mt in 2017).

Sources: IEA Global Methane Tracker 2024 | ICF: 'Making sense of the noise', 2015

Reducing methane emissions is one of the most effective ways to quickly slow the rate of climate change.

84x more potent than C02

30% rise in global temperatures due to Methane

The Business Cost of Methane Emissions to Oil & Gas Companies

$1B
ANNUALLY

LOST PRODUCT

Methane emissions can cost energy producers $1 billion annually in lost commercial value. By taking action to stop methane leaks, the oil and gas industry can save money and slow climate change.

Source: The Stanford Report | March 13th, 2024

REGULATORY NON-COMPLIANCE

Regulatory non-compliance around methane emissions carries steep business costs or lost business deals for oil and gas companies. Penalties include multimillion-dollar fines, mandated operational shutdowns, and increased scrutiny from regulators, all of which drive up compliance and legal expenses.

Why Methane Monitoring?

Meet Your Emissions Reduction Goals

Companies worldwide have aggressive goals to reduce their carbon footprint. Detecting and eliminating sources of methane emissions is a huge step to meeting those goals.

Regulatory Compliance

Many regions have already – or are starting to – require methane emissions monitoring and reporting and have announced fines for non-compliance.

Operational Efficiency

Identifying leaks can help prioritize repairs to improve production capacity as well as provide insights for the prioritization and validation of capital projects.

Investor Relations / Reputation Management

Reducing emissions enhances public perception and industry credibility and is attractive to customers and investors.

Introducing MethaneTrack™

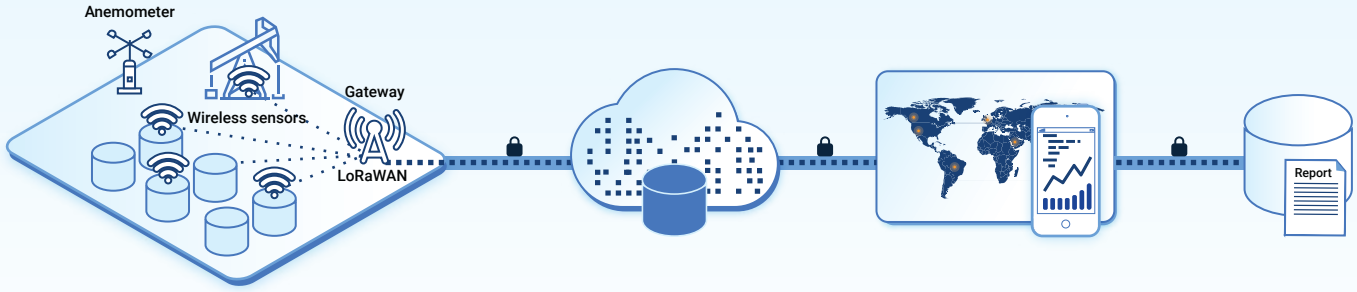
Improve operational efficiency and quickly mitigate emission events with real-time detection, localization, and quantification of methane emissions*.

- Reduce the cost of LDAR with remote, real-time emissions data.
- Receive automatic alerts with emission location & volume.
- Comprehensive reporting supports OGMP 2.0, EPA and EU regulations.
- Gain insights on failure causes for continual improvement.
- Intrinsically Safe, certified for Class I, Division 1 (FM, CSA) and Zone 0 (ATEX, IECEx), with IP65 ingress protection.
- Purpose-built for harsh environments: -40°C to 75°C 100% RH.
- Virtually maintenance-free with 5-year battery life/15-year sensor life and no required field calibration.
- A typical site installation can be completed by a single technician in just a few hours.

* NevadaNano also offers EmissionsTrack™ for Hydrogen and Hydrogen-Methane blends.

MethaneTrack™ System Overview

A typical MethaneTrack™ installation consists of a gateway, an anemometer, and multiple wireless sensors deployed at each site.



1. MethaneTrack™ intrinsically safe wireless sensors sample the air close to the leak source, to accurately measure gas concentrations.
2. Encrypted data is transmitted to the cloud, where proprietary Leak Source Isolation™ algorithms analyze the data, along with the wind data from the anemometer, to quantify the leak size and pinpoint the leak location.
3. MethaneTrack's™ dashboard analytics and reporting platform visualizes the data and automatically alerts the right people that an emission event has occurred.

The MethaneTrack™ Wireless Emission Sensor

Precise, portable, and virtually maintenance-free

A complete "Fix-and-Forget" solution

- **No field calibration**
  Immunity to saturation and poisoning and no field calibration eliminates the prohibitive cost of quarterly calibration trips & sensor replacements.
- **Highly accurate detection powered by MPS™**
  Detection range from 50 to 1M ppm with built-in environmental compensation for temperature, relative humidity, and pressure for near-zero false positives.
- **Very wide operating range & self-testing**
  -40°C to 75°C operating range with up to 100% relative humidity. Built-In Self-Test (BIST) capability continuously evaluates the system to ensure it is operating to specification.
- **5-year battery life and 15-year sensor life**
  No wiring and long battery and sensor life reduces the need for frequent on-site visits and ensures uninterrupted monitoring.
- **Certified as *Intrinsically Safe***
  Certified for Class I, Division 1 (FM, CSA) and Zone 0 (ATEX, IECEx), with IP65 ingress protection.

5-YEAR BATTERY LIFE

15-YEAR SENSOR LIFE

Simple and efficient installation in minutes

- ✓ Mounted onto existing infrastructure
- ✓ No need for wiring.
- ✓ A typical site installation can be completed by a single technician in just a few hours – enabling installation of several sites per day per installer.

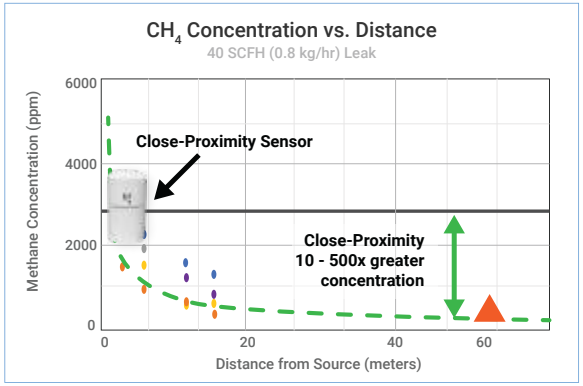
Close-Proximity Continuous Monitoring™

WITH PROXIMITY COMES ACCURACY

MethaneTrack™ wireless sensors are certified ***Intrinsically Safe***, which means they can be **installed inside the hazardous area** and mounted next to--or even on--a potential leak source.

NevadaNano calls this method *Close-Proximity Continuous Monitoring™* - a breakthrough approach that enables immediate detection to **obtain the most precise measurements of emission location and emission rates**, due to proximity to the emission source.

- **Immediate detection before the wind dilutes and distorts the gas plume**
- **Ultra-low false positives**
- **Highly accurate emission localization**
- **Best in class quantification of the emission rate**



Improve LDAR efficiency and minimize risk of fines with continuous, remote monitoring

Technicians are directed to the leak location, reducing the time they spend on-site and increasing the speed at which repairs can be conducted.

With real-time alerts and detailed analytics, operators can address issues swiftly and prevent costly emissions events before they escalate.

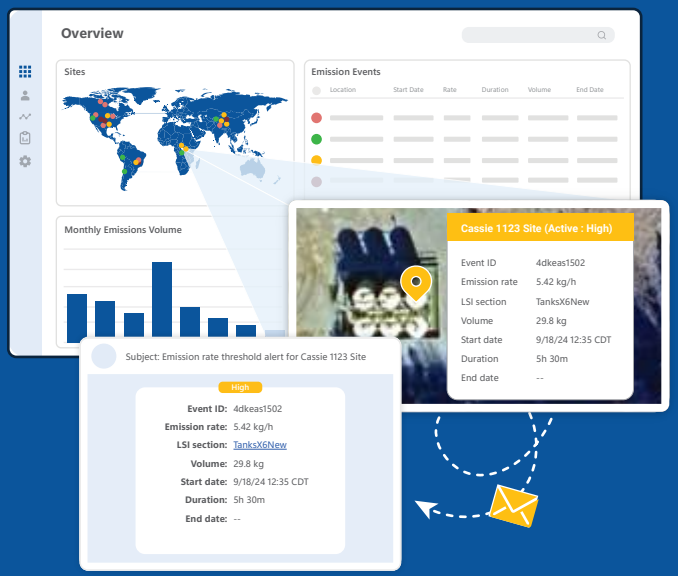
- ✓ Eliminate manual monitoring
- ✓ Fewer site trips & less time on-site
- ✓ Eliminate regulatory blind-spots
- ✓ Dramatically speed-up time to repair

Ensure the protection of sensitive data with multi-layer security

- ✓ Single Sign-On (SSO) multi-factor authentication
- ✓ Customizable Role Based Access Control (RBAC)
- ✓ Comprehensive data encryption of data
- ✓ Vulnerability and penetration testing

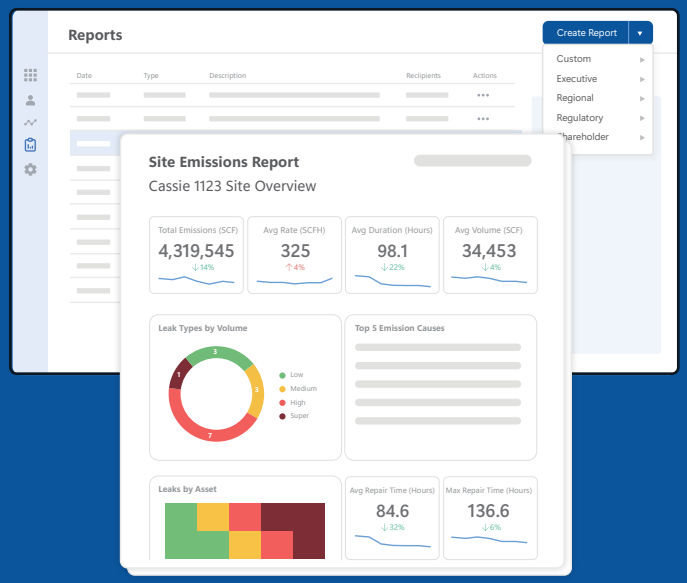
MethaneTrack™ Dashboard Analytics & Reporting

Emissions tracking & compliance made easy



Empowering teams to seamlessly work together

- Monitor all levels from enterprise to site and assets.
- Visualize the location and size of emissions.
- Real-time alerts automatically notify the right people.
- Enable users to focus on their area of responsibility.
- Distinguish between operational and fugitive emissions.



Simplified regulatory compliance with customizable reports

- **Reduce the cost of tracking and reporting emissions** with automatic tabulation of total emissions.
- **Validate emissions compliance performance** with complete, historical emissions records for individual sites, regions, and countries to support OGMP activity, comply with EPA OOOOa, OOOOb, OOOOc, and EU methane regulations.
- **Meet the needs of different stakeholders** such as operators, executives, regulators, and shareholders, with pre-built and configurable reports.

CASE STUDY

National Gas Transmission Extends MethaneTrack™ Monitoring Pilot at Bacton Gas Terminal with Great Success

Installation of 155 wireless sensors in just 3 days

Multiple leak detection & notification

Leak locations confirmed

Overview

A large-scale trial at Bacton Gas Terminal evaluated NevadaNano's MethaneTrack™ continuous monitoring solution in detecting, locating, and quantifying methane leaks with clear visualization and precise timestamp data—enabling engineers to investigate and remediate leaks promptly.

Rapid Setup and Deployment

At this critical UK energy hub on the Norfolk coast, 155 battery-powered wireless sensors were installed across seven high-leak zones, accompanied by two anemometers and two LoRa gateways. The system was fully deployed in just three days, with no wiring required and no disruption to site operations.

Results

Over six months, MethaneTrack™ recorded 161 leak events—from under 1 scfh (0.03 kg/hr) to as much as 9,100 SCFH (231 kg/hr)—with total emissions from monitored areas totaling 9,990 kg for the period. Ground verifications confirmed detection accuracy: leak locations were typically within 5 m of actual source, persistent emissions over 1.0 L/min were reliably captured, and even small leaks (~0.2 L/min) were occasionally identified.

Next Steps: Trial Extended & Expanded

National Gas Transmission has extended the trial at Bacton to evaluate system integration into site operations and expanded trials at FutureGrid to advance hydrogen and hydrogen-blend detection capabilities.

national gas transmission

The methane aspect of the project was a great success – we have shown that the system can be deployed with relative ease across our AGI sites, which will ultimately enable significant reductions in methane emissions from the network.

Additionally, the live field work to test the system's hydrogen capabilities is a truly innovative first step towards the safe operation of a hydrogen network – ensuring we can minimize emissions from future hydrogen sites.

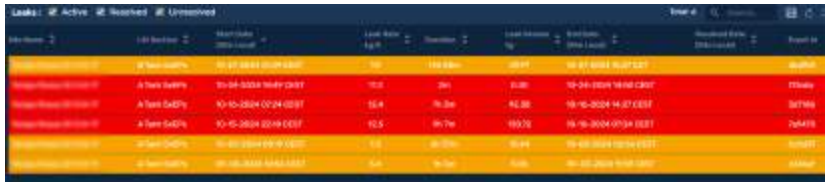
More work is needed across the industry in the hydrogen detection space, and we are proud to work with NevadaNano to develop their promising technology.

Alistair Carvell
Innovation Engineer
National Gas Transmission

CASE STUDY

Global Energy Producer in Europe Chooses MethaneTrack™ to Monitor Floating Roof Tanks to Minimize Fugitive Emissions

Installation of 10 MethaneTrack™ wireless sensors in just a few hours



LSI emission events displayed on the MethaneTrack™ monitoring dashboard

Emission details on MethaneTrack™ specifying location, volume, and duration of leak

Overview

A major global energy producer has chosen NevadaNano's MethaneTrack™ continuous monitoring solution to help detect and mitigate costly emissions from their floating roof tanks.

Rapid Setup and Deployment

Ten wireless sensors were installed along with 1 anemometer, connected to 1 LoRa gateway for seamless data integration and cloud connectivity. Due to the battery enabled hardware, installation was completed in just a few hours, and required no additional wiring or affected any operational teams on site.

Immediate Leak Detection & Localization

During the 2 months after the MethaneTrack™ system was online, the system reported several LSI events.

By looking at the emission data and comparing it to tank fill levels during the leak events, operators determined there must be some damage to the tank wall at a certain height.

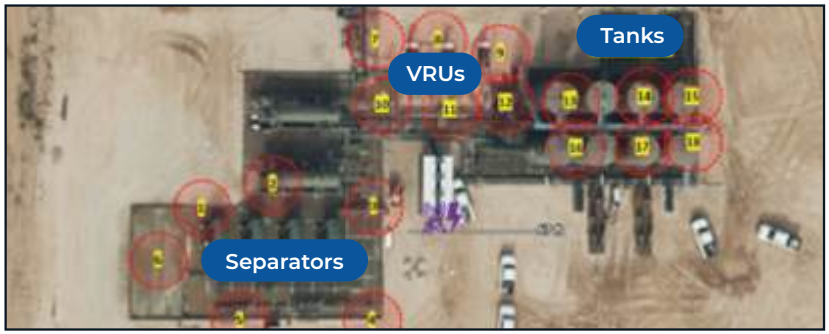
On-the-ground investigations performed by the operators confirmed that there was damage in the tank wall in two locations.

Results

MethaneTrack™ allowed the operators to fill the tank with confidence to minimize fugitive emissions, regardless of the level of product in the tank.

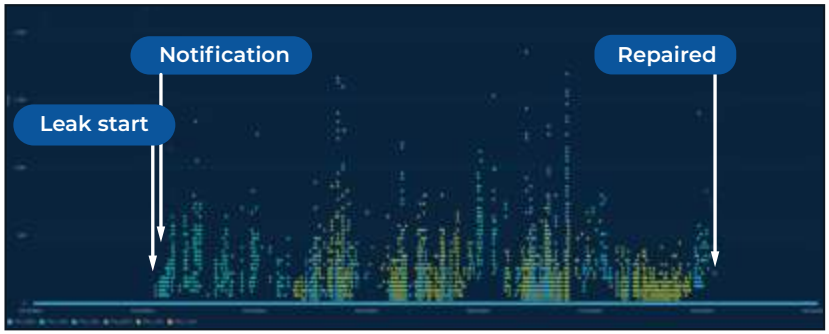
CASE STUDY

MethaneTrack™ Pilot Program in Permian Basin Achieves 95% Reduction in Methane Emissions



Installation of 18 MethaneTrack™ wireless sensors in under 3 hours


MethaneTrack™ LSI alert displaying emission duration, rate, location and volume.



Real-time emission event data

Background

Large upstream customer in the Permian Basin seeking to enhance environmental responsibility and operational efficiency engages NevadaNano for a MethaneTrack™ pilot program.

Rapid Setup and Deployment

Quick Installation: Eighteeen MethaneTrack™ wireless sensors were installed and online within 3 hours, meeting customer requirement of simple, quick, and easy setup.

Immediate Leak Detection & Localization

Real-Time Detection: MethaneTrack™Identified a significant leak event immediately after commissioning.

Precise Repair Guidance: Pinpointed leak location in VRU area to direct repair team to the exact leak source

Results

Fast Resolution: Leak repaired within 5 days, with a 95% decrease in emissions for the leak event.

Sustainability Impact: Showed measurable progress toward facility's environmental goals.

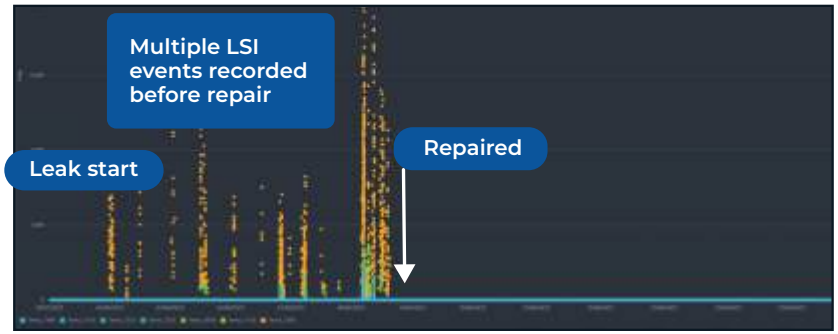
Operational Efficiency: Reduced potential long-term costs associated with prolonged emissions.

CASE STUDY

Thief Hatch Leak Detected by MethaneTrack™ Quickly Identified, Resulting in Rapid Repair

MethaneTrack™ wireless sensor mounted on tank near thief hatch

Emission details on MethaneTrack™ platform specifying location and volume of leak



Real-time emission event data

Problem

Tank and thief hatch emissions contribute to more than half of the greenhouse gas (GHG) emissions in the upstream oil and gas sector.

Solution

MethaneTrack™ *Close-Proximity Continuous Monitoring*™

Customer Installation

MethaneTrack™ wireless sensors were installed just above 6 tank thief hatches at a client site in Texas.

Leak Detection & Notification

Real-Time Detection: Identified a several leaks, within the first 24 hours of installation.

Precise Repair Guidance: Directed customer to check a specific thief hatch location.

Results

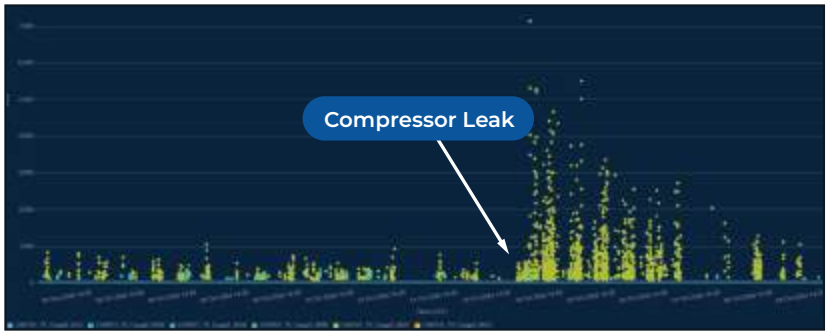
Technician confirmed identified thief hatch had a damaged seal and repaired it, minimizing environmental impact and lost product.

CASE STUDY

MethaneTrack™ Helps Customer Identify and Control Leaks from On-Site Compressors, Significantly Reducing Emissions

MethaneTrack™wireless sensor mounted in close proximity to compressor

MethaneTrack™ platform displaying locations of multiple emission events



Real-time emission event data

Problem

Compressor monitoring can be a significant source of fugitive methane emissions. Because they do not leak continually, periodic monitoring is unlikely to detect leaks, costing companies money and exposing them to environmental fines.

Solution

NevadaNano's MethaneTrack™ system uses *Close-Proximity Continuous Monitoring*™ around the compressor to monitor drives, slip, shafts, joints, relief lines and seals, and notifies operators with the location and size of leaks, enabling rapid repair.

Rapid Leak Detection & Localization

Real-Time Detection: Identified leakage coupled with compressor usage and run time data.

Precise Repair Guidance: Pinpointed the leaking compressor and where on the compressor, to dramatically improve time to repair.

Results

Pattern Detection: Allowed customer to see time-of-day and day-of-week when leaks were occurring.

Sustainability Impact: Identified assets that required replacement or upgrades.

Operational Efficiency: Link to compressor run-time data provided enhanced leak analytics and validation.

CASE STUDY

MethaneTrack™ Solves Emissions Challenges with Close-Proximity Monitoring Near Pump Jacks and Well Heads

MethaneTrack™ wireless sensor mounted in close proximity to christmas tree well head

Emission details specifying location, volume, and duration of leak

Problem

There are significant challenges detecting and localizing methane emissions at the well head, as the methane gas dissipates at a distance 10 feet from the leak source.

Solution

NevadaNano's MethaneTrack™ wireless emission sensors are certified intrinsically safe, allowing them to be secured directly on or adjacent to existing pump jack and well head infrastructure for real-time *Close-Proximity Continuous Monitoring*™. The MethaneTrack™ software system notifies operators of the location and size of leaks, enabling rapid repair.

Rapid Leak Detection & Localization

Real-Time Detection: Identified a significant issue other technologies failed to detect or localize.

Precise Repair Guidance: Pinpointed which well head was producing fugitive emissions to dramatically speed up time to repair.

Results

Fast Detection
Leak identified within minutes

Sustainability Impact
Showed measurable progress toward facility's environmental sustainability goals.

Operational Efficiency
Dispatch team knew exactly where to go to repair. Reducing LDAR costs.

NevadaNano

Protecting People, Property, and Planet

About NevadaNano

NevadaNano provides safety and climate solutions for many of the world's largest corporations, with innovative multi-gas sensing products and continuous IIoT monitoring systems for detecting, quantifying, and reducing gas emissions.

More information at www.nevadanano.com

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