

OGMP 2.0 Level 5 Reporting with Continuous Monitoring



Continuous monitoring captures methane emissions over the entire reporting period as they actually occur—not as short snapshots. Sensiron Connected Solutions' Nubo Sphere solution combines high-frequency measurements, coverage-aware deployment, and transparent uncertainty accounting to enable credible OGMP 2.0 Level 5 reporting at scale.

What OGMP 2.0 Level 5 requires

OGMP 2.0 Level 5 combines source-level inventories (Level 4) with site-level measurements to create a reconciled, measurement-informed emissions estimate. Operators must conduct a defensible comparison between bottom-up and top-down results, supported by explicit uncertainty quantification and a transparent reconciliation methodology.

Why continuous monitoring matters

Methane emissions at oil and gas sites fluctuate significantly—

often by more than an order of magnitude within hours or days. Traditional periodic surveys capture only brief emissions snapshots and thus frequently miss intermittent or short-duration events (Figure 1). Extrapolating snapshot measurements to annual inventories can therefore introduce significant errors in the reported annual site totals. Continuous monitoring captures real-world variability, reducing uncertainty, and enabling explicit alignment between site- and source-level inventories. It also reduces on-site labor, simplifies reconciliation and provides actionable mitigation insights.

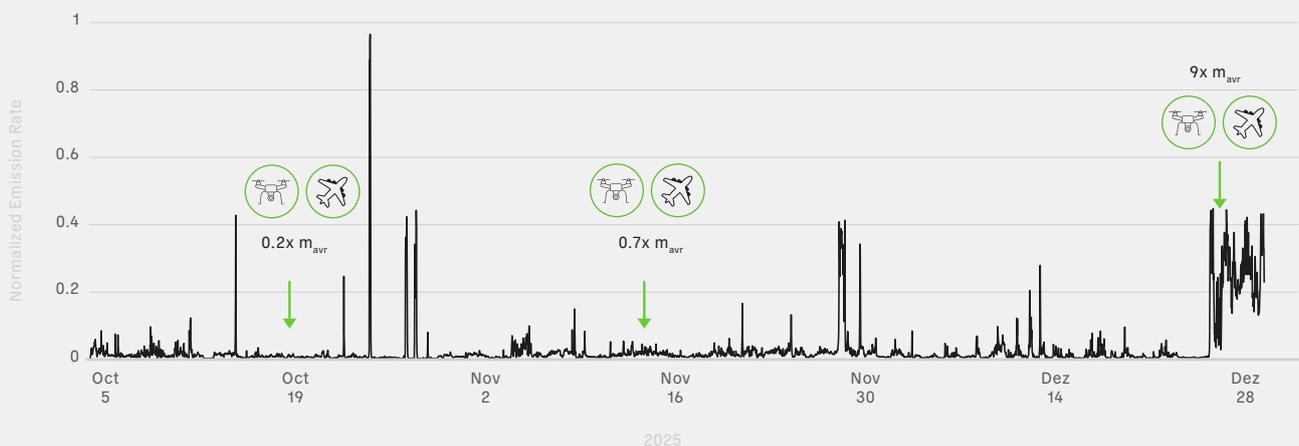


Figure 1

Total site emissions from a compressor site demonstrating the high temporal variability of emissions on operated oil and gas sites. Periodic surveys would result in significantly different estimates for annual site totals depending on the exact timing of the survey. Depending on when a periodic survey occurred, it would have captured only 0.2×, 0.7×, or as much as 9× the average emission rate (m_{avr}) calculated over the full observation period.

A scalable pathway to Level 5 compliance

Sensirion Connected Solutions offers site-level emissions quantification with our Nubo Sphere point sensor (or fenceline) solution. In addition, we offer continuous optical gas imaging and proximity sensors complementing Nubo Sphere for improved source localization and coverage of difficult to monitor sources like flares.

a)



b)

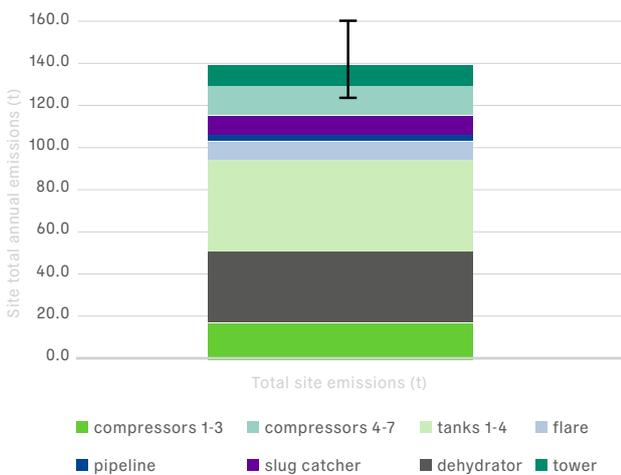


Figure 2

a) Coverage analysis prior to deployment. The coverage of all equipment sources is calculated using local atmospheric conditions. Sources with sufficient coverage are indicated with map-pins in green.

b) Exemplary site total results with attribution to equipment groups.

A five-steps practical pathway to OGMP 2.0 Level 5 with continuous monitoring:

1. **Coverage-based deployment plan** using site geometry and atmospheric simulations.

2. **Multi-layered technology deployment** tailored to site complexity and layout (Nubo Sphere, Nubo Sentry, Kuva camera) for full-site coverage, including indoor areas, elevated emission sources, short-duration emission events, and automated event detection.

3. **Continuous quantification** with validated gap-filling and uncertainty estimation.

4. **Measurement reconciliation** with bottom-up Level 4 inventories.

5. **Annual reporting** with transparent methodology and year-over-year improvement.

Accurate site-level emissions accounting requirements for continuous monitoring solutions:

- Sufficient coverage of all material emissions sources.
- Unbiased emissions quantification estimates.
- Identification of observability gaps for each emission source and statistically robust gap-filling methodology.
- Transparent calculation and reporting of uncertainties.

Coverage-driven deployment strategy

Before deployment, an assessment of all potential emission sources is performed to ensure sufficient coverage for estimating site totals with low uncertainty (Figure 2a). The coverage assessment enables strategic deployment of a fixed number of sensors at optimized locations. Difficult-to-monitor emission sources, like elevated points, are flagged and supported by, for example, Kuva optical gas imaging to achieve full-site coverage.

Validated performance of Nubo Sphere

The quantification performance of Nubo Sphere point sensor solution has been verified in the 2025 ADED2.0 controlled release campaign, that was designed to replicate real-world methane emissions complexity, with multiple sources starting and stopping independently over timescales from seconds to days.

The Nubo Spere results:

- Low statistical scatter
 - 90% of emissions within $\times 1.5$ of ground truth
 - 98% within $\times 2$ of ground truth
- Low systematic bias
 - -2.5% bias relative to ground truth

Quantification accuracy is further reduced by longer temporal averaging resulting in below <5% statistical uncertainty over periods of weeks relevant for annual emissions inventories.

Site level inventories

Commercial continuous monitoring deployments often use moderate sensor densities, which naturally create observability gaps when no sensor has geometric visibility of an emission plume. Sensirion's coverage-aware accounting workflow explicitly identifies these gaps and separates the data into high-confidence "observed" intervals and intervals requiring gap-filling.

"Observed" intervals provide direct, measurement-based emission rates, while each equipment group's gaps are filled using the average emissions observed during its measured periods. This simple and transparent method reconstructs full-period site totals without introducing artificial bias.

Even when "observed" intervals represent only ~40% of total emissions in a typical four-sensor deployment at METEC, the combined "observed" + "gap-filled" totals reproduce full-period site emissions within $\pm 10\%$ uncertainty, enabling credible OGMP 2.0 Level 5 reporting.

Site total 12 hr moving average

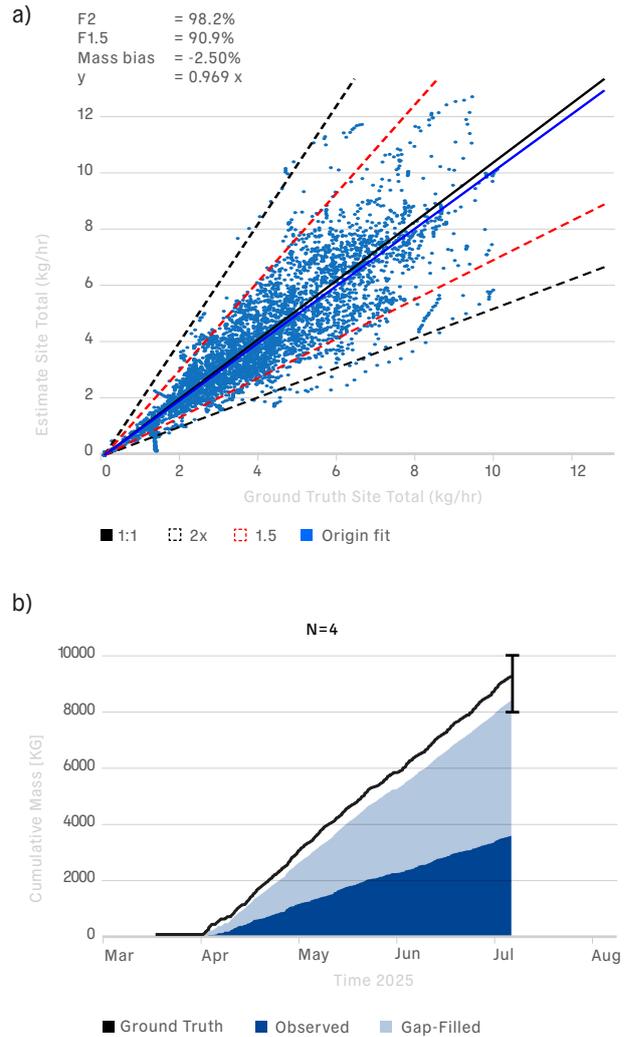


Figure 3
a) 12-hour moving-average site totals for a 4-sensor configuration. The data shows low bias of -2.5% (blue line) with 98% of emissions estimates within x2 (dashed black line) and 90.9% within x1.5 (dashed red line) of the ground truth.
b) Cumulative site level emissions showing "observed" (dark blue) and "gap-filled" (light blue) contributions. Estimated totals closely follow controlled release ground truth with minimal reporting period bias.

Take the next step

These results confirm that Nubo Sphere delivers unbiased, high-accuracy methane quantification with low uncertainty that meets the requirements for reliable, measurement-based OGMP 2.0 Level 5 reporting.

Sensirion Connected Solutions supports operators worldwide in achieving robust, auditable, and defensible OGMP 2.0 Level 5 reporting. Built on industry-leading sensor technology, rigorous scientific validation, and transparent accounting methodologies, Sensirion Connected Solutions is a leader in continuous methane monitoring and emissions quantification. [Contact us](#) to discuss your project needs and portfolio-wide roadmap.