

BRIDGER PHOTONICS

The Cadence Decision

What higher survey frequency is worth to an oil and gas operator

A business case built on Bridger measurement data, 2022 to 2025: 34 business units, 11 North American basins, and roughly 25,000 facility visits repeated each year.

THE BOTTOM LINE

How often you scan your production assets for emissions is a capital decision.

Across roughly 25,000 facility visits repeated each year over a 3-year period, operators that surveyed more often achieved larger emissions reductions. Moving from one to two surveys per year increased the average total emissions reduction from 13.3% to 19.1%, while operators flying quarterly reduced total emissions by 49.4%. By Year 3, the average operator flying quarterly was recovering an estimated \$1.74 million a year in gas value and had cut super-emitter frequency by 66%.

Why it pays: every ton of methane kept in the system is sellable gas recovered, one less reportable release event, and a more defensible emissions inventory. Best-in-class programs treat quarterly as the floor for active management and go higher where variability, reduction targets, or reporting confidence justify it.

The decision you are actually making

Aerial measurement is now a standard tool for finding and managing methane emissions across O&G operations. The open question for most operators is no longer whether to measure, but how often. Survey cadence is usually framed as a program-design detail. It is better understood as a capital-allocation choice, because what you buy with each additional survey round shows up directly on the P&L and the risk register.

Higher cadence converts into value along four lines: **recovered product, lower compliance and reporting exposure, more defensible emissions inventories, and stronger asset value and market access.**

What the data shows: A cadence curve

Four years of measurement across 34 business units and 11 North American basins, roughly 25,000 facility visits repeated each year, let us ask a question models cannot answer: what happened to emissions for operators who flew more often? For each operator, we compared emissions in its third year of measurement to its first, then grouped the results by survey frequency, ensuring the reductions reflect performance at the same facilities rather than changes in portfolio composition.

Operators with more frequent surveys achieved materially larger reductions in measured emissions between Program Years 1 and 3. The pattern is not subtle, and its shape is the important part. The benefit increases gradually at first, then rises sharply at higher survey frequencies. Comparing Program Year 1 to Year 3, the move from annual to semiannual surveys added 5.8 percentage points

of reduction, from 13.3 to 19.1 percent: a real gain, but a modest one. The step change came at higher frequency. Operators surveying four or more times a year cut emissions by 49.4 percent, roughly two and a half times the semiannual result. The largest returns in the program come not from stepping off an annual cadence but from moving past periodic follow-up entirely, to sustained high-frequency monitoring.

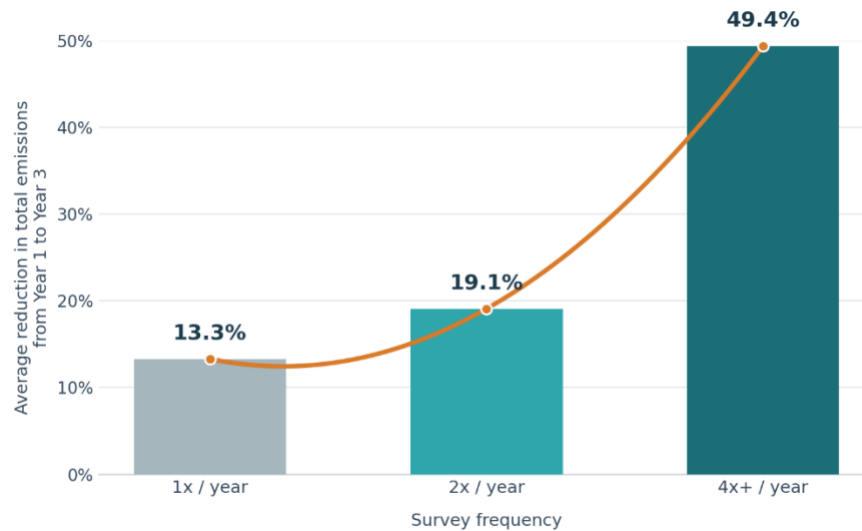


Figure 1. Average reduction in total emissions from Program Year 1 to Year 3, by annual survey frequency. The largest single step comes from moving from semiannual to four or more surveys per year.

Higher cadence also attacked the sources that matter most. **Among programs surveying at least quarterly, the frequency of super-emitters above 100 kg per hour fell by 66 percent.** Those are precisely the events that dominate both lost-gas volume and reporting exposure.

What those reductions are worth

Methane you do not vent is natural gas you can sell. Using a methane density of about 0.0192 metric tons per Mcf, each 1,000 metric tons abated is roughly 52,000 Mcf of gas, worth about **\$156,000** at an illustrative \$3.00 per Mcf. Cadence turns that mechanism into recurring recovered revenue.

ILLUSTRATIVE ECONOMICS

Consider an average operator in our dataset: about 600 sites, emitting 22.5 kilotons of methane a year at the start of their program. At ~52 Mcf per ton and \$3.00 per Mcf, abated emissions translate directly into recovered gas value. By Program Year 3, operators on an annual cadence had cut emissions enough to recover about \$471,000 a year, semiannual operators about \$676,000 a year, and operators surveying quarterly about \$1.74 million a year, before any compliance or asset-value benefit. The cadence decision itself, moving from annual to high-frequency surveying, is worth about **\$1.27 million a year**, and that difference recurs every year the program runs. Replace the emissions and realized price with your own to size the case for your assets.

The compliance value for operators in the US is real: NSPS OOOOb and OOOOc leak-detection-and-repair obligations and state programs in Colorado, New Mexico, and California continue to apply. Super-emitters above 100 kg per hour also carry outsized lost-gas volume, reputational risk, and exposure across multiple regulatory frameworks. The 66 percent reduction in their frequency is

consequential well beyond any single reporting rule. Higher cadence is how you find and verify repairs on the sources that drive both results and reputation.

Two further levers compound over time.

- **Market and capital access:** buyers and lenders increasingly ask for verified, low-methane gas, and a denser measurement record is the evidence base for differentiated or certified sales.
- **Asset value:** at transaction, a clean and well-documented emissions profile reduces diligence friction and the risk of a valuation discount.

Is it the cadence, or the operator?

This is observational data, so the fair challenge is obvious: high-cadence operators may simply have been the most committed to begin with. Three features argue that cadence itself is doing real work.

- **A graded dose-response.** Reductions rise with frequency (13.3, 19.1, 49.4 percent), tracking how many flights you get, not a step change between motivated and unmotivated operators.
- **Not a narrow artifact.** Gains appear in both total emissions and super-emitter frequency, at the same facilities measured in Year 1 and Year 3, so the reduction cannot come from portfolio turnover.
- **A clear mechanism.** More surveys shorten the time between when a source starts and when it is caught, separate persistent leaks from intermittent events, and add repair-and-verify cycles within the year. The effect has an operational pathway, not just a correlation.

We report this as a measured association, not a controlled trial. The evidence points to cadence as a lever operators can pull, not merely a sign of who they already were.

What to do: cadence by operator profile

There is no single right answer, but there is a clear standard. Operators should match cadence to the materiality and variability of their assets and to what they need the data to prove.

Cadence	Best fit	What you get
Annual (1x)	Low-variability, low-materiality assets, or a first-year baseline.	Screening for significant standing sources. Limited visibility into anything that starts, recurs, or varies after the flight. ~13.3% average reduction. Potential recovered gas value per year ~\$471,000*
Semiannual (2x)	Active emissions management on producing assets. The default for most operators.	Improvement over annual screening, with ~19.1% average reduction in emissions from Year 1 to Year 3 and ~28.2% fewer super-emitters. Potential recovered gas value per year ~\$676,000*
Quarterly+ (4x) <i>Best-in-class Programs</i>	Operational excellence, aggressive reduction or certification targets, or inventory-grade reporting.	Largest total reductions (~one-half), 66% fewer super-emitters, and the strongest inventory confidence. Potential ~\$1.74 million in recovered gas value per year*

Cadence is a lever, not the whole machine

Measurement does not cut emissions by itself. The value is realized when surveys feed timely investigation, repair, verification, and root-cause analysis, so a source that is fixed once does not come back. What cadence does is create more opportunities for that loop to run: faster detection, confirmed repairs, earlier catches of newly emerging sources, comprehensive emissions intelligence.

For most producers the question is not whether to measure but how often, and the data gives a clear answer: the returns concentrate at quarterly or better. Bridger can model the cadence that fits your asset base and reporting goals, and translate it into expected recovered gas against your own baseline.