



*GTI Energy's Methane
Emissions Measurement
and Verification Initiative*

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Methodology for Measurement Informed Methane Emission Estimates and Verification for Natural Gas Value Chain



veritas.gti.energy

EPA – 2023 International Emissions Inventory Conference
September 28, 2023

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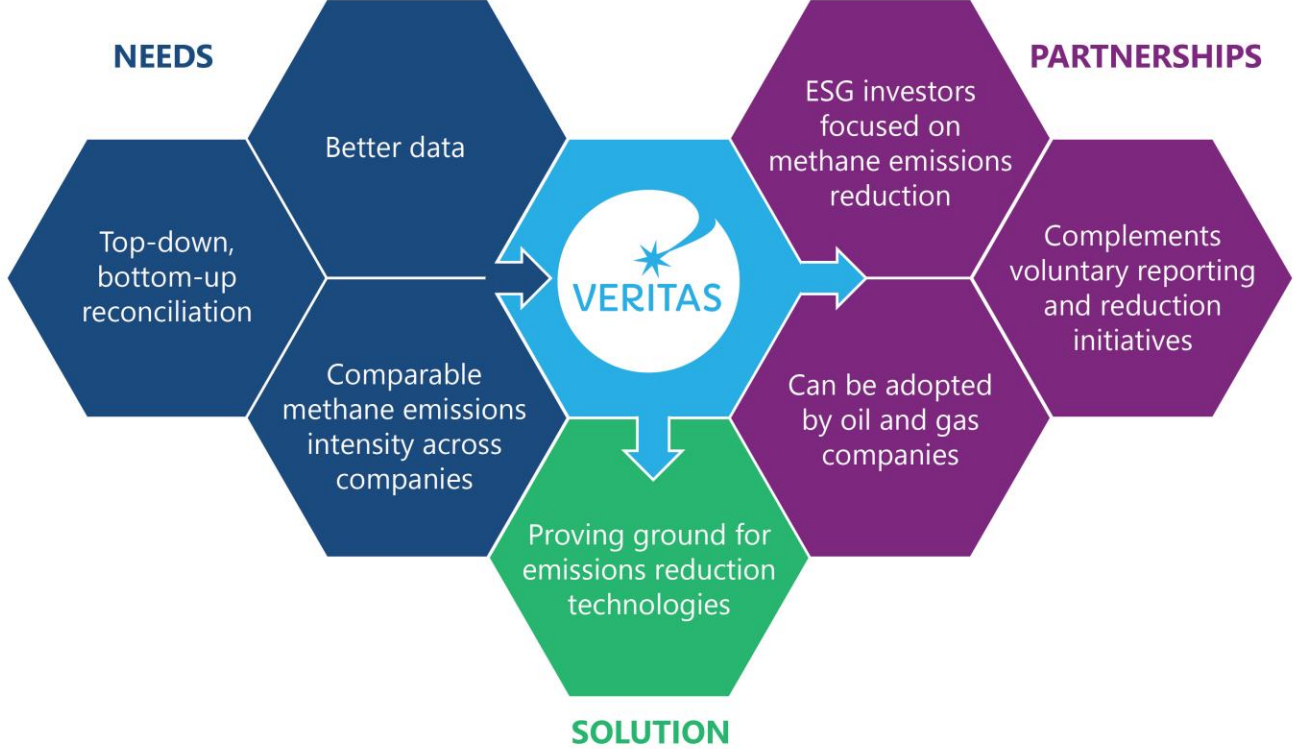




VERITAS

Transparent, consistent approach to measuring methane emissions

Veritas is a standardized, science-based, technology-neutral, measurement-informed approach to calculating and reporting methane emissions





VERITAS IMPACT TO DATE



Partners: **37 organizations** representing operators from all NG segments, eNGOs, and financial stakeholders.



Protocols Testing – 2023

20 operators testing the public Veritas protocols in their fields. Feedback and findings will be incorporated in version 2 on **December 18th**.



First version of Protocols, measurement uncertainty, and data collection guidance published **Q1 2023**.



Regulatory Update



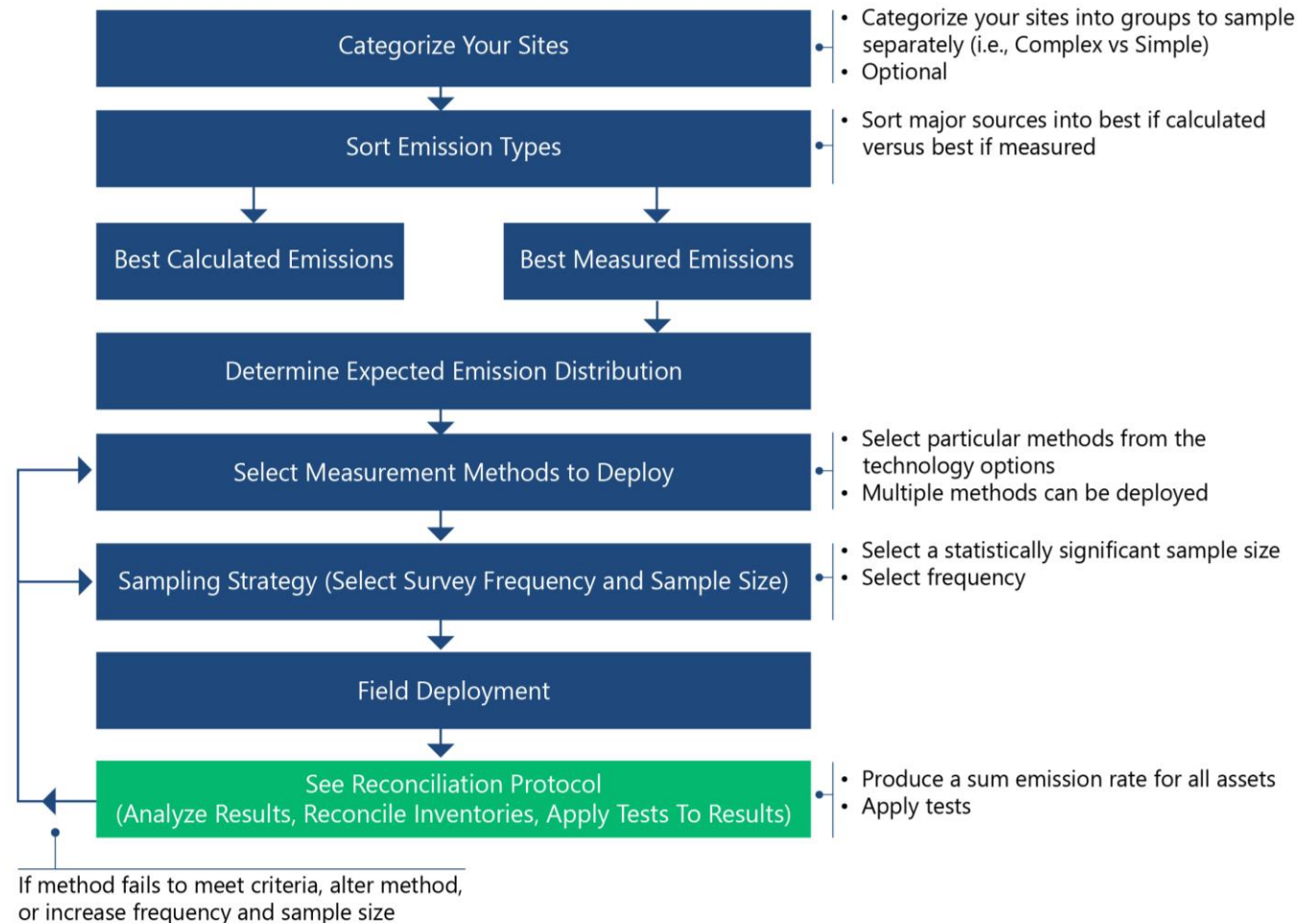
Meetings and presentations to a **broad set of stakeholders** including energy companies, trade associations, EPA, DOE, international conferences (LNG2023 and World Petroleum Congress).



DOE iM4 AOI-3 and MMRV

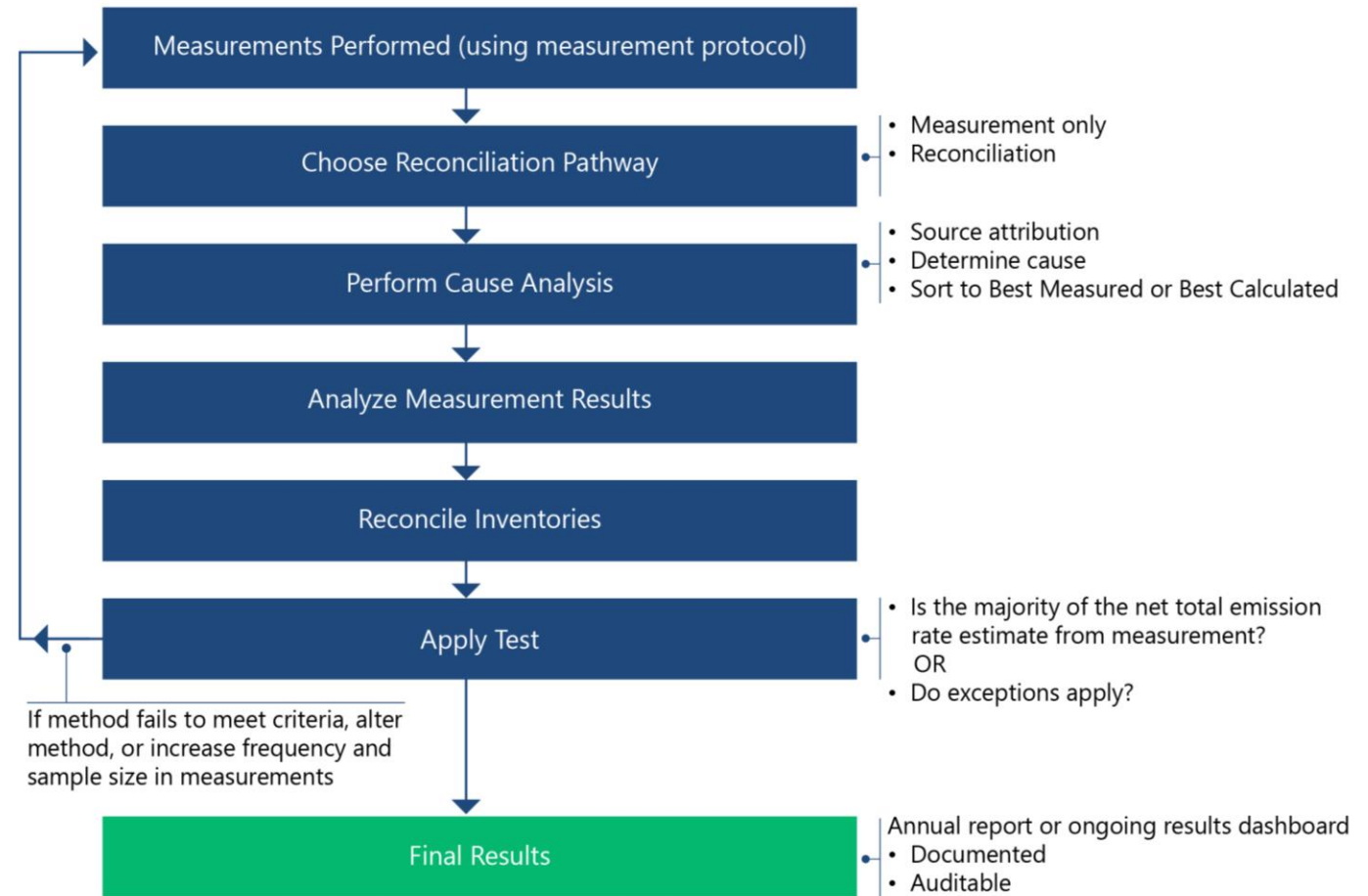
Production Measurement Protocol

- **Measurement Target: Whole site flux** and technologies or combinations of technologies that can make that whole-site measurement.
- **Technology: Technology agnostic.**
- **Minimum Sampling Frequency: Annual** (higher recommended for complex sites that are more likely to have larger emissions).
- **Minimum Sample Size: 100%** of all sites, annually (sub-groups encouraged at higher frequency).
- **Accounting for Intermittency:** Scientific data allowed to set frequency, duration of intermittent sources, otherwise ergodic and extrapolated.
- **Best Calculated: Allowed** for well tracked, intermittent sources.



Production Reconciliation Protocol

- **Reconciliation: Creating a measurement-informed inventory (MII), by site.**
 - $MII_s = ER_m + ER_b + ER_t$ (then sites are summed for the asset area)
- **Test Applied: is 50% of the measurement informed inventory based on actual measurements?**
 - Exception allowed: the best available, and/or lowest MDL technology applicable to the assets and location.





Methane Emission Intensity Protocol

$$EI (\%) = \frac{\text{Methane Emissions (metric tons)} * \text{Gas Ratio}}{\text{Natural Gas Throughput (Mscf)} * \text{Methane Content (mole fraction)} * \frac{0.0192 \text{ metric tons}}{\text{Mscf}}} * 100$$

Where:

Gas Ratio = Energy equivalent of natural gas processed divided by the total energy equivalent of processed natural gas and liquids (dimensionless)

Segment Intensity Divisors

Production
Net Methane Produced for Sales

Gathering & Boosting
Net Methane Throughput

Processing
Net Methane Throughput

Transmission & Storage
Company Throughput as Reported to PHMSA

LNG
Net Methane Throughput

Distribution
Net Methane Distributed through LDC Assets



Value Chain Summation Protocol

- Veritas protocol refers to the ONE Future “Methane Emissions Estimation Protocol” to convert company segment intensities to additive intensities that can be summed across segments
- Convert segment intensities to a common gross production basis

$$EI_C = \sum_i^n \left(EI_i \cdot \frac{(TP_S)_i}{GP} \right)$$

- EI_C : Emissions intensity of a Company
- n : number of segments a Company spans across
- EI_i : Emissions intensity for segment i of the Company
- TP_S : National throughput for segment i
- GP : National gross production



Assurance Protocol

Criteria for Adopting Veritas

- Company *must* follow Measurement Protocol and Reconciliation Protocol
- Company *must* have an internal assurance process
- Assurance provider *must* demonstrate independence
- Third-party is *encouraged*
- Public facing report or dashboard *must* be published annually
- Reconciliation Report *should* be transparent

Assurance Activities That Shall Occur

- Confirmation of documentation of steps to follow an internal or external assurance process
- Review of competency assessments of the implementors of the Veritas initiative
- Review of past assurance activities related to Veritas
- Review of data systems, responsibilities, quality assurance, and oversight
- Confirmation of record and retention procedures



2023 Workstreams

- Testing of released protocols with sponsors
- Protocols Version 2.0
- OGMP2.0 Feasibility Study
- Detailed Uncertainty Guidance
- Reporting Template
- Production and Distribution Examples
- Assurance Training



2023 Testing Learnings

- Many operators do not have the in-house expertise to perform an uncertainty or any statistical analysis on the data
 - Need tools to perform uncertainty analysis
- Logistical and Environmental challenges with securing measurement data
 - Wind speed and direction need to be in a specific range
 - Daylight and winter weather related issues in colder regions
 - Availability and scheduling with technology vendors
- Difficult to reach the 50% measured emissions threshold
- Smaller operators might lack the resources to measure 100% of their assets annually
 - Also need more support with reconciliation and emissions intensity estimation activities



PLANNED UPDATES TO PROTOCOLS IN V2.0 (SO FAR)

- Combination of protocols to make the framework more succinct and efficient:
 - Measurement and Reconciliation Protocols will be combined
 - Production and gathering and boosting will be combined
 - Processing, transmission & storage, and LNG segments will be combined into a single Midstream protocol
- Specific Examples to be included throughout each step of the protocols
- Clarification on sections as requested through user feedback
 - Sample Planning
 - Application of 50% test in reconciliation protocol

...More to come in October



UNEP OGMP 2.0

[OGMP 2.0](#) has 95+ member companies and has substantial global reach, including assets in many of the participant countries of the Global Methane Pledge

[Veritas](#) is the *HOW* OGMP 2.0 provides principles-based guidance. OGMP 2.0 guidance is general and broad by design, because it covers multiple segments and must be globally applied. Therefore, the OGMP guidance does not provide details of “how” to perform estimates and measurements.

Goal

- Create a new pathway within Veritas to estimate emissions using a measurement-informed source-level inventory
 - Site-level measurements used to verify accuracy
 - Guidance on sampling frequencies and coverage
 - Guidance on calculating Level 4 inventory, and checking Level 4 with Level 5
 - Information and guidance on fugitive emissions, combustion, and flaring
- Incorporate new pathway into Veritas protocols
- Publication of first draft in **February 2024**



VERITAS 2024 GOALS

1. Continuous improvement and educational outreach of Veritas protocols.
 - As in 2023, continue to receive feedback via one-on-one meetings, in-person events, and virtual meetings.
 - Continue to provide educational outreach to energy stakeholders on measurement informed inventories.
 - Adapt protocols, as needed, to be in alignment with state and federal regulations, like recent EPA and CDPHE rulings.
2. Support companies utilizing Veritas from sample planning to report writing with the goal of having a public facing document.
 - Develop 2023 white paper on testing of version 1 protocols.
3. Support testing of source-based methane emission measurement campaigns for companies looking to develop Level 4 OGMP 2.0 reports.
4. Educate/support energy companies in early stages of using advanced methane measurement tools to develop a methane measurement informed intensity in the US and abroad.
 - Translate version 2 of the protocols into Spanish, Arabic, Mandarin, Japanese, Korean.
5. Feedback from the scale-up of Veritas to basin-wide scale through DOE iM4 and LNG value chain.
6. Utilize Veritas reports to support Life Cycle Assessments for the natural gas industry.
7. Work with auditing companies on Veritas assurance.



Veritas Pre-Conference Workshop to be held on Oct 4th morning

Early-bird registration is now open!

Join **GTI Energy** and **Colorado State University Energy Institute** October 4-5, 2023 as we host the tenth annual **CH₄ Connections** conference in Fort Collins, Colorado.

[REGISTER HERE](#)





THANK YOU

Questions? Please contact the Veritas leadership team



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