



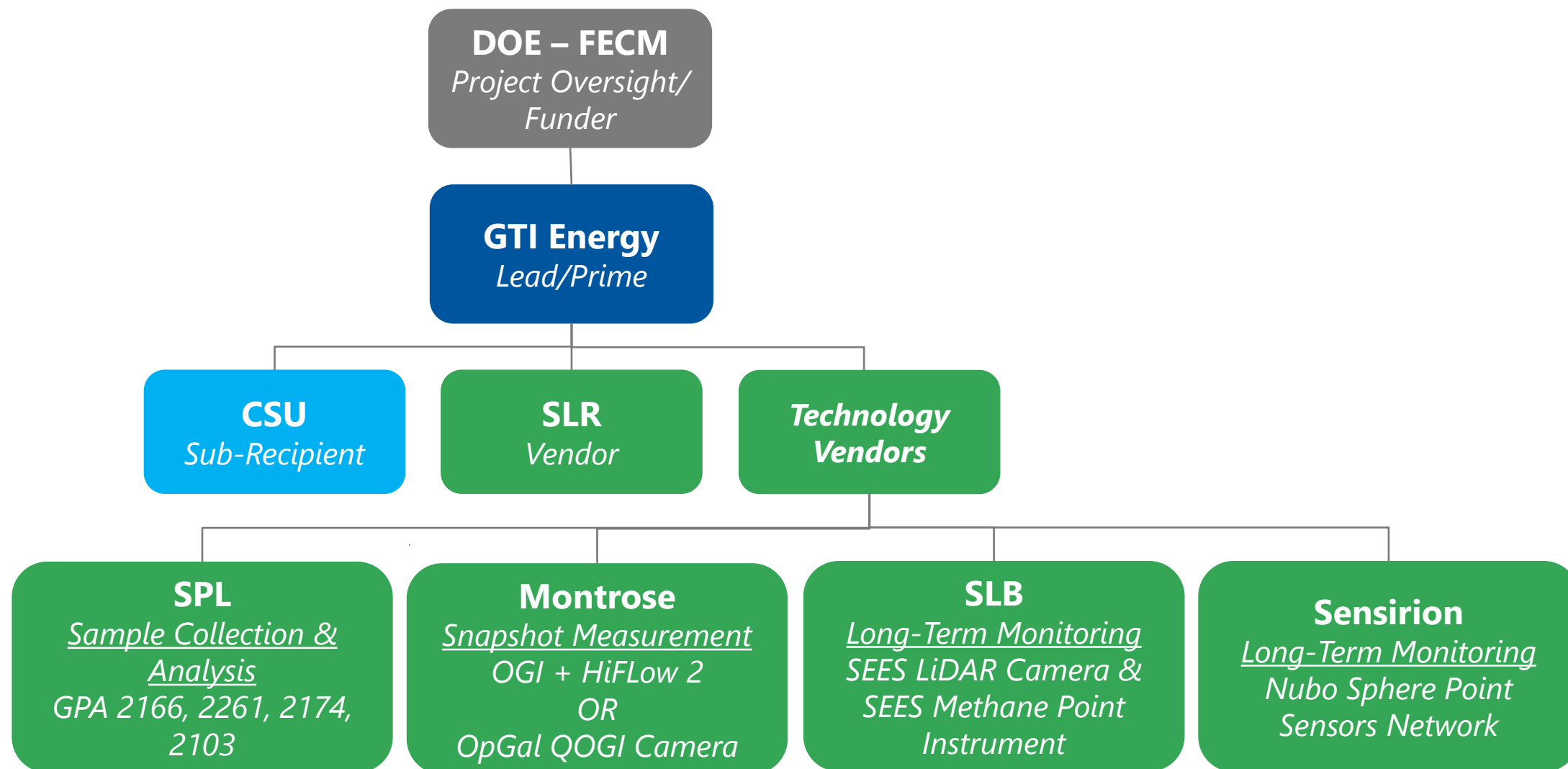
GTI ENERGY

solutions that transform

DE-FE0032287: Storage Tank Emissions Assessments and Quantification (STEAQ)

Continuation Meeting
May 28, 2024

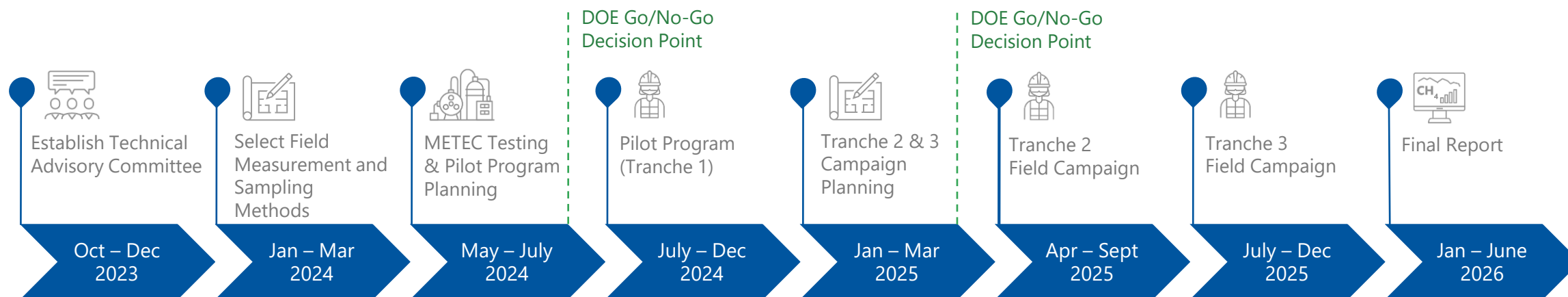
Project Team



Project Objectives

- Develop a database on upstream storage tank configurations and associated equipment through operator survey including tank type, function, age, gas throughput, etc.
- Develop robust measurement-based methane emission factors and equipment counts of storage tanks that reflect current upstream operational practices for integration within the EPA GHGI.
- Understand causes, frequencies, and rates of intermittent emissions and incorporate those results in the emission factors or emission estimation methods
- Develop guidance on the effectiveness of tank monitoring and control systems for detecting and mitigating emissions

Project Timeline



Technical Approach

- Technologies and deployment approach being tested at CSU's METEC – May-July 2024
- Measurements campaign will be held in 3 tranches targeting different basins and operators:
 - Tranche 1 – July-September 2024 – 50 sites in Upper Green River Basin
 - Sites already secured
 - Tranche 2 – April-September 2025 – Goal 500 sites in Bakken and Permian Basins
 - Sites in the process of being secured
 - Tranche 3 – July-December 2025 – Goal 200 sites
 - Basin and sites yet to be decided on
- Snapshot measurements to be performed on all 750 sites
- Long-term monitors will be deployed in a subset of 150 sites
- Sample collection and analysis will be performed on a subset of 100 sites

Task 1 – Project Management and Planning

Completed

Subtask 1.0 – Project Management Plan (PMP)

- Created and revised Project Management Plan, rev 1.

Subtask 1.1 – Project Reporting Requirements

- Quarterly reporting at the end of each quarter
- Financial reporting in the form of SF-425
- Monthly accruals

Accomplishments

Budget Period 1

- Contracting has been fully executed with subrecipient, Colorado State University.
- Contracting has been fully executed with three of the five project vendors, Montrose Environmental, SLR and Sensirion, SLB, and SPL have been drafted and are currently being red lined for final edits.
- Site Access agreements for technology vendors for METEC testing have been fully executed.
- GTI Energy presented the scope of the project to the ONE Future coalition and to the Colorado Oil and Gas Association (COGA). The purpose of these external presentations is to support the recruitment of industry partners for site access.
- Risk mitigation identified a controlled test program that would inform the project team of the necessary requirements for the full field roll out, and applied lessons learned.
- Srijana Rai presented a poster on the Project at the 2024 NETL Resource Sustainability Project Review Meeting in Pittsburgh from April 2-4, 2024.

Work Remaining

Project Management

- On going project management practices for tracking work progress, budget, risks, and communications. Final contracting agreements with technology providers.

Expected

Project Tasks

- Field Measurement agreements with operators.
- Finalized contracts with, SLB, and SPL expected before the end of BP1.
- Revised budget justification.
- Updated PMP, rev 2
- Revised timeline for remaining project work and updated milestones (to be included in PMP update)

Task 1 – Project Management and Planning

BP2 Plan

Project Plan

- The SOPO for BP2 that was originally approved will remain unchanged, however some updates to the milestones and due dates have been. This scope of work will be completed in BP2, any unused funds from BP1 will be rolled forward into BP2 and BP3. No additional funds or time for the project will be required.

Subtask 1.1 – Project Reporting Requirements

- Quarterly reporting at the end of each quarter
- Financial reporting in the form of SF-425
- Monthly accruals

Task 2 – Diversity, Equity, Inclusion, and Accessibility

Completed

Task 2.1: Create and engage a network of community-based users through full group and subgroup meetings

- Stakeholder Analysis (nationwide)
- Community-User Network (18 members)
- Held 1 full-group meeting; 2 sub-group meetings
 - Participation tracking; summary reports documenting community feedback
- 3 interviews

Task 2.1: Create accessibility to project-related & methane related information

- Public facing website (im4.gti.energy)
- 1-page project fact sheet (English and Spanish)

Task 2.4: Conduct DEIA/ EJ training with technical staff and project partners

- January 29, 2024: Intersection between DEIA and EJ
- May 3, 2024: EJ Fundamentals
- (optional) July 15, 2024: TBD

AOI 5 Community User Network Members

Category	Organizations
Environment/EJ	CATF (2); Green Latinos; EarthWorks; Eco El Paso; Frontera Alliance; Wild Earth Guardians; Sierra Club; Earth Works Action
Community	Community Action Association of Pennsylvania; Ohio Valley Health Center
Public Health	Weld County Department of Public Health and Environment; Denver Department of Public Health and Environment (2);
Government Affiliates	Colorado Energy and Carbon Management Commission (3); Colorado Department of Air Pollution Control



Public facing website

Task 2 – Diversity, Equity, Inclusion, and Accessibility

Expected to be Completed in BP1

Task 2.1 & 2.2: Community Engagement & Outreach

- 1 full group meeting; 1 sub- group meeting
- **Community Stakeholder Inclusivity report**
- Conduct interviews
- Evaluation & **share results of findings**

Task 2.4: Conduct DEIA/ EJ training with new hires (Summer 2024 intern)

- Review recorded DEIA/EJ training
- Review EJ, public health and community engagement resources
- Engage in 1:1 discussion regarding topics

BP2 Plan

Task 2.1: Create and engage a network of community-based users through full group and subgroup meetings

- Continue to engage with the Community-user Network
- Share project related and methane related information
- **Community Stakeholder Inclusivity report**

Task 2.2: Mapping methane emissions by geographical area

- **Develop mapping model**
- Gather and **document community feedback on ease of access and clarity of data published**

Task 2.4: Diverse recruitment of interns and technical rotational development programs

- Continue DEIA/EJ trainings

Task 3 – Develop Field Measurement Methods

Completed

Task 3.1: Refine field method (snapshot)

- 9 proposals from vendors evaluated
- Montrose Environmental selected (technologies described later)
- Contract executed
- Opgal QOGI camera testing started at METEC

Task 3.2: Refine long-term monitoring

- 12 proposals from vendors evaluated
- 2 vendors selected: SLB and Sensirion
- Sensirion contract executed
- Sensirion testing started at METEC

Task 3.3: Select gas composition sampling method and frequency

- 4 proposals from vendors evaluated
- SPL selected to perform sample collection and analysis
- Contract executed

Expected to be Completed in BP1

- SLB contract
- METEC testing

BP2 Plan

- METEC testing Report

Task 4 – Field Campaign Planning

Completed

Task 4.1: Partner Recruitment

- 50 sites with one operator, Jonah Energy, secured for the Pilot Program

Expected to be Completed in BP1

Task 4.1: Partner Recruitment

- Commitment letters from two more operators
- Hundreds of additional sites

Task 4.2: Field Campaign Plan

- Campaign plan for the pilot program expected to be done in June

BP2 Plan

Task 4.1: Partner Recruitment

- Commitment letters from more large and small operators
- Secure all remaining sites to achieve the goal of 750 sites

Task 4.2: Field Campaign Plan

- Campaign plan for tranche 2 & 3 will be developed in BP2
- Covering all remaining sites

Task 5 – Field Measurement Campaign

Task not started yet

Expected to be Completed in BP1

Task 5.1, 5.2, & 5.3: Field Measurements, Long-term Tank Monitoring, & Flask Tank Modeling

- Snapshot measurements on 15 sites in July
- Long-term monitors installed and operative on 10 sites in July
- Collect samples from 5 sites in July

BP2 Plan

Task 5.1, 5.2, & 5.3: Field Measurements, Long-term Tank Monitoring, & Flask Tank Modeling

- Snapshot measurements on remaining 35 sites in the pilot program
- Long-term monitors installed 10 sites in July will continue to measure emissions until August 2024
- Collect samples from 10 more sites during the pilot program
- Tranche 2 field campaign will begin in BP2 – April 2025 and continue into BP3
 - The exact number of sites available for this tranche will be decided in the March 2025

Budget Status

BP 1 – Budget Status

- An update on the technical approach has been formally proposed to our FPM during
- Remaining funds from BP1 will be redistributed across the remaining budget periods.
- GTI has proposed a pilot program in BP1
- GTI will implement snapshot measurements on Jonah Energy's 50 and deploy long-term monitors on at least 15 of those sites
- Below is a table showing the status of Budget Period one pre-change request.

Budget Period 1 (pre change request)

Quarterly Report Table									
Quarter			Estimated Federal Share	Actual Federal Share	Estimated Recipient Share (Cost Share)	Actual Recipient Share (Cost Share)	Cumulative Estimated Federal + Recipient Share	Cumulative Actual Federal + Recipient Share	Variance Estimated Minus Actual (Federal + Recipient)
FY 2023	BP 1	Q3	\$59,533.00	\$62,069.00	\$0.00	\$0.00	\$59,533.00	\$62,069.00	(\$2,536.00)
		Q4	\$588,311.32	\$89,062.00	\$0.00	\$0.00	\$588,311.32	\$89,062.00	\$499,249.32
FY 2024	BP 2	Q1	\$1,220,109.10	\$135,842.84	\$0.00	\$0.00	\$1,220,109.10	\$135,842.84	\$1,084,266.26
		Q2	\$124,014.08	\$0.00	\$0.00	\$0.00	\$124,014.08	\$0.00	\$124,014.08
		Q3	\$122,641.99	\$0.00	\$526,250.00	\$0.00	\$648,891.99	\$0.00	\$648,891.99
		Q4	\$588,565.22	\$0.00	\$0.00	\$0.00	\$588,565.22	\$0.00	\$588,565.22
FY 2025	BP 3	Q1	\$1,145,818.38	\$0.00	\$0.00	\$0.00	\$1,145,818.38	\$0.00	\$1,145,818.38
		Q2	\$110,192.75	\$0.00	\$0.00	\$0.00	\$110,192.75	\$0.00	\$110,192.75
		Q3	\$136,465.99	\$0.00	\$500,000.00	\$0.00	\$636,465.99	\$0.00	\$636,465.99
		Q4	\$602,385.39	\$0.00	\$0.00	\$0.00	\$602,385.39	\$0.00	\$602,385.39
FY 2026		Q1	\$1,165,343.21	\$0.00	\$0.00	\$0.00	\$1,165,343.21	\$0.00	\$1,165,343.21
		Q2	\$136,619.10	\$0.00	\$473,750.00	\$0.00	\$610,369.10	\$0.00	\$610,369.10
Totals			\$5,999,999.53	\$286,973.84	\$1,500,000.00	\$0.00	\$7,499,999.53	\$286,973.84	\$7,213,025.69

Budget Status

BP 2 – Budget Status

- At the time of this continuation application, it is fully anticipated that the scope of work (as outlined in the SOPO) for next year will not change or be revised. Thus, the BP2 effort will remain unchanged.
- The total budget will remain the same but be re-allocated across BP2 and BP3. Any unused funds from the BP1 work (as discussed in the previous section) will be rolled forward to the remaining Budget Periods.
- Below is a table showing the budget post-reallocation of remaining funds across future Budget Periods.
- Changes will be finalized during the formal change request.

Budget Period 2 &3 (post change request)

Budget Report Table (BP 1 carry over estimates)									
Quarter			Estimated Federal Share	Actual Fedral Share	Estimated Recipient Share (Cost Share)	Actual Recipient Share (Cost Share)	Cumulative Estimated Federal + Recipient Share	Cumulative Actual Federal + Recipient Share	Variance Estimated Minus Actual (Federal + Recipient)
FY 2023	BP 1	Q3	\$59,533.00	\$62,069.00	\$0.00	\$0.00	\$59,533.00	\$62,069.00	(\$2,536.00)
		Q4	\$588,311.32	\$89,062.00	\$0.00	\$0.00	\$588,311.32	\$89,062.00	\$499,249.32
FY 2024	BP 1	Q1	\$1,220,109.10	\$176,142.00	\$0.00	\$0.00	\$1,220,109.10	\$176,142.00	\$1,043,967.10
		Q2	\$124,014.08	\$540,000.00	\$135,000.00	\$0.00	\$259,014.08	\$540,000.00	(\$280,985.92)
	BP 2	Q3	\$122,641.99	\$0.00	\$0.00	\$0.00	\$122,641.99	\$0.00	\$122,641.99
		Q4	\$588,565.22	\$0.00	\$0.00	\$0.00	\$588,565.22	\$0.00	\$588,565.22
FY 2025	BP 2	Q1	\$1,145,818.38	\$0.00	\$0.00	\$0.00	\$1,145,818.38	\$0.00	\$1,145,818.38
		Q2	\$110,192.75	\$0.00	\$491,250.00	\$0.00	\$601,442.75	\$0.00	\$601,442.75
	BP 3	Q3	\$136,465.99	\$0.00	\$0.00	\$0.00	\$136,465.99	\$0.00	\$136,465.99
		Q4	\$602,385.39	\$0.00	\$400,000.00	\$0.00	\$1,002,385.39	\$0.00	\$1,002,385.39
FY 2026	BP 3	Q1	\$1,165,343.21	\$0.00	\$0.00	\$0.00	\$1,165,343.21	\$0.00	\$1,165,343.21
		Q2	\$136,619.10	\$0.00	\$473,750.00	\$0.00	\$610,369.10	\$0.00	\$610,369.10
Totals			\$5,999,999.53	\$867,273.00	\$1,500,000.00	\$0.00	\$7,499,999.53	\$867,273.00	\$6,632,726.53

BP1 Technical Outcomes

- Technologies Selected
- Operator Partners
- METEC Testing



Snapshot Measurement Technologies

- [Montrose Environmental](#) will execute the tasks on field
- FLIR Gf320 OGI camera will be used for detection followed by SEMTECH HI-FLOW 2 fugitive methane analyzer for quantification of emissions
- In scenarios, where accessing the thief hatches is difficult or in the presence of H₂S, the field team will use Opgal EyeCGas 2.0 QOGI camera for detection and quantification of methane emissions



FLIR Gx320 Camera



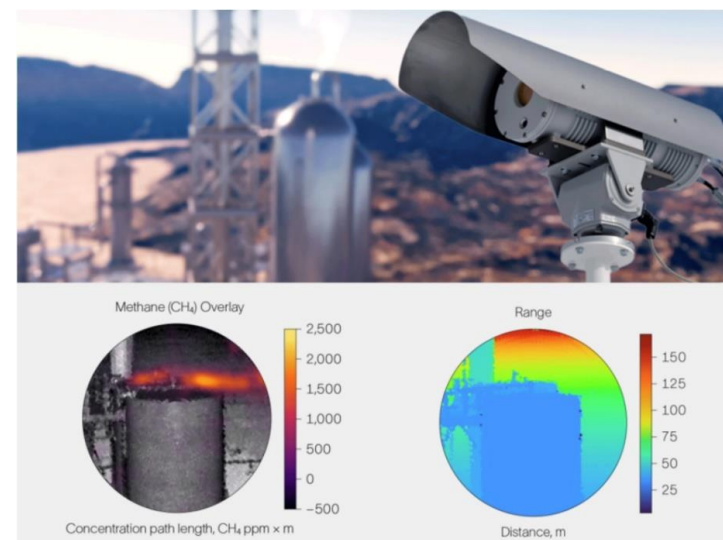
SEMTECH HI-FLOW 2 Fugitive Methane Analyzer



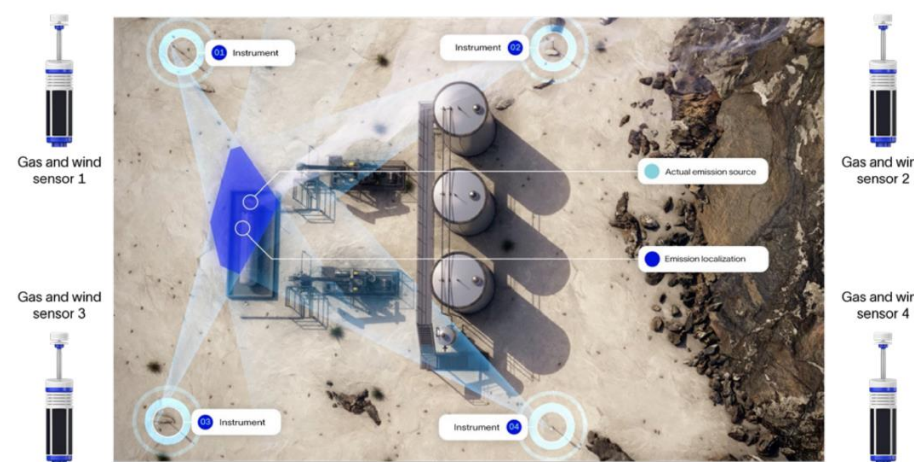
Opgal EyeCGas 2.0 Camera

Long-Term Monitoring Technologies

- SLB will deploy their [SLB End-to-End Solutions \(SEES\)](#) Methane LiDAR Camera and Point Instrument technology on a subset of selected sites.
- [Sensirion](#) will deploy their Nubo Sphere Point Sensor network on a subset of selected sites
- Field team and Operators will have full access to real time data through both vendor's dashboards.



SEES LiDAR Camera Solution



SEES Methane Point Instrument and an example of a network installation



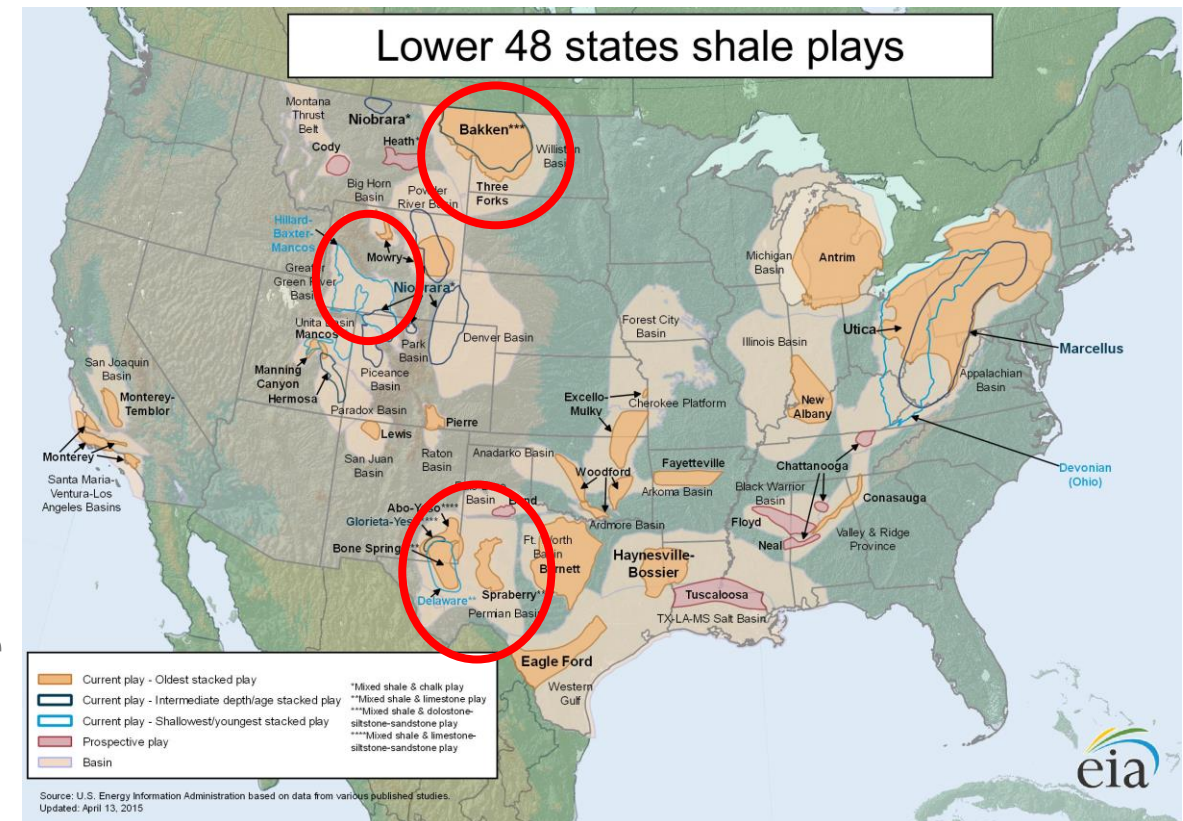
Nubo Sphere

Sample Collection and Analysis

- [SPL Labs](#) will collect and analysis gas and liquid samples from a selected subset of sites
- The following methods will be used for field collection and lab analysis of samples:
 - GPA 2166 (gas sampling method),
 - GPA 2261 (gas analysis through hexanes plus),
 - GPA 2174 (pressurized liquid sampling), and
 - GPA 2103 (Pressurized liquid analysis).

Operator Partners

- Jonah has committed to provide 50 sites
 - In Green River Basin in Wyoming
 - Measurements at Jonah sites begin in July (BP1)
- Exxon Mobil has verbally committed to provide access to sites
 - In Bakken basin
 - Number of sites and formal commitment letter expected in this BP
- Conoco Phillips has verbally committed to provide access to sites
 - Most likely in Permian basin
 - A few hundred sites expected
 - Formal commitment letter expected in this BP



METEC Testing

- Opgal QOGI camera being tested
- Sensirion Nubo Spheres deployed
 - 8 sensors focused on tanks
 - Will monitor until end of July (2.5 month duration)
- SLB will deploy 1 LiDAR camera and a point sensor network focused on tanks
 - Pending contract execution
 - Expected to deploy in mid-June
- Testing Report will be submitted in BP2



Milestones – BP 1 & 2

Budget Period	Task #	Milestone Description (Updated)	Planned Completion Date	Actual Completion Date	Verification Method	Comments
1	1.0	Project Management Plan	8/24/2023	8/24/2023	PMP file	
1	2.0	Diversity, Equity, Inclusion, and Accessibility Plan	10/24/2023	10/24/2023	DEIA Plan file	
1	3.1	Field measurement protocol document (field measurements)	3/31/2024	03/29/2024	Report	
1	3.2	Field measurement protocol document (long-duration monitoring)	3/31/2024	03/29/2024	Report	
1	3.3	Field measurement protocol document (gas composition sampling)	3/31/2024	03/29/2024	Report	
1	4.1	Commitment and cost share letters for partners for the field campaign tranches – Tranche 1	3/31/2024	03/29/2024	Signed letter from operator	Jonah Energy Letter
1	4.2	Field campaign plan for tranche 1 (pilot program)	3/31/2024 (has changed)	In progress	Campaign Plan Worksheet	07/31/2024 (new planned completion date)
2	3.0	METEC Testing Report	8/31/2024	In progress	Report	New milestone added
2	5.1	Measurement plan completed, coverage statistics reported (field measurements) – Tranche 1	9/30/2024 (has changed)	Not yet started	Report	01/31/2025 (new planned completion date)
2	5.2	Measurement plan completed, coverage statistics reported (long-duration monitoring) – Tranche 1	9/30/2024 (has changed)	Not yet started	Report	01/31/2025 (new planned completion date)
2	5.3	Equation that can be used to determine flash emissions based on known conditions - Tranche 1	9/30/2024 (has changed)	Not yet started	Report	01/31/2025 (new planned completion date)
2	2.1	Community stakeholder inclusivity report 1	12/31/2024	Not yet started	Report	
2	2.2	Results from community interviews per basin (Period 1)	12/31/2024	Not yet started	In Community Stakeholder Report	
2	2.3	Document of submitted comments on ease of access and clarity of data published	12/31/2024	Not yet started	Comments List	
2	4.1	Commitment and cost share letters for partners for the field campaign tranches – Tranche 2	12/31/2024 (has changed)	Not yet started	Signed letter from operator	04/30/2025 (new planned completion date)
2	4.2	Field campaign plan for tranche 2	12/31/2024 (has changed)	Not yet started	Campaign Plan Worksheet	04/30/2025 (new planned completion date)
2	5.4	Presentation of results for tranche 1	3/31/2025	Not yet started	Presentation	



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