

Motivation

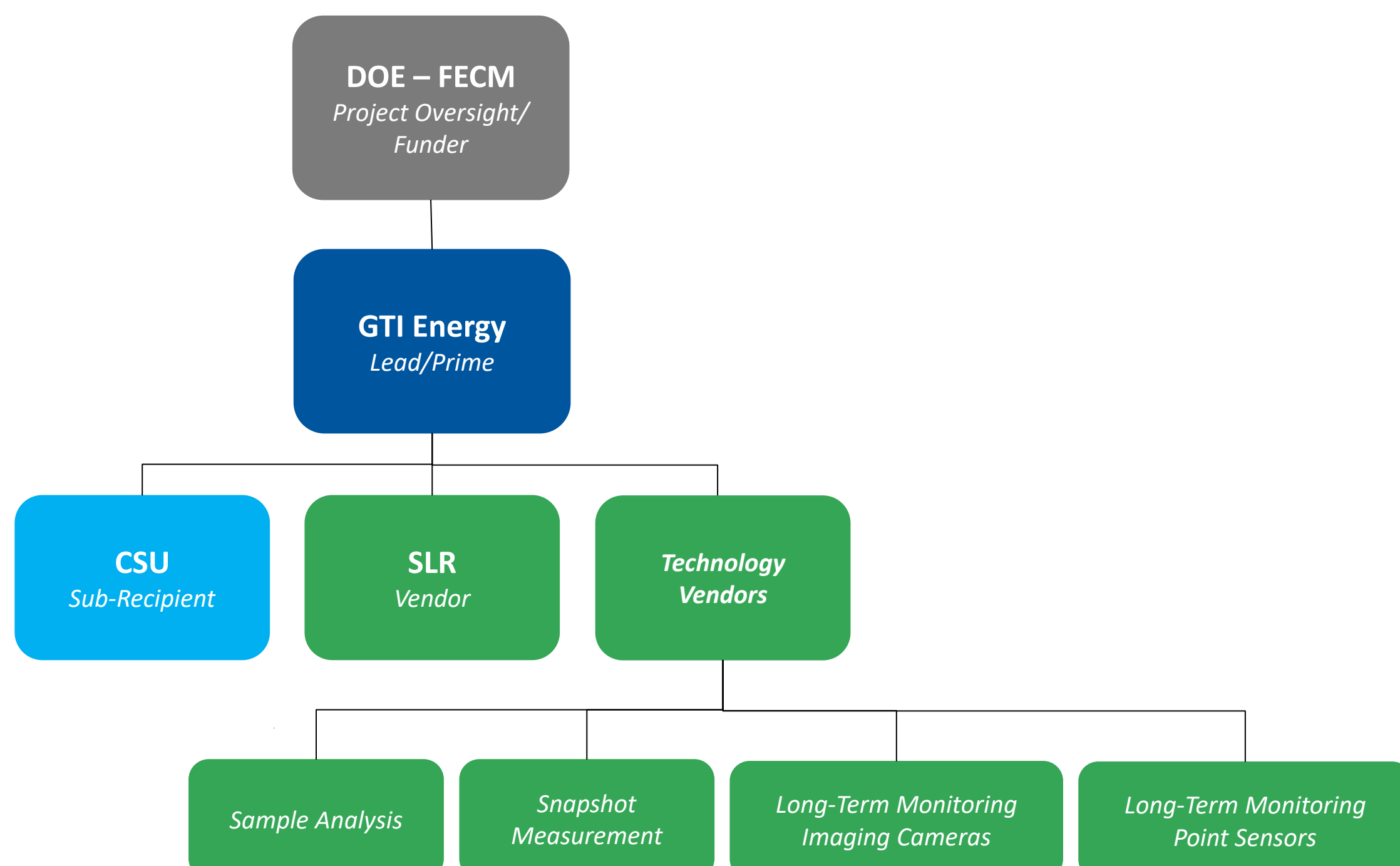
Recent aircraft-based measurements have indicated significant emissions from upstream oil and gas storage tanks, which may be underestimated in reported Inventories. There is a need to update the legacy methane emission factors for storage tanks based on new targeted measurement studies pursuing accurate and representative tank emissions. To fill this gap GTI Energy was recently awarded funds from U.S. DOE under Area of Interest 5 of the funding opportunity “Innovation Methane Measurement, Monitoring and Mitigation Technologies (iM4 Technologies)” to improve the understanding of tank emission profiles and develop more representative emission factors.

Project Objectives

The main objective of the project is to use sound scientific basis to generate robust emissions factors for tanks and equipment counts that reflect current upstream operational practices for integration within the EPA GHGI. This involves developing a database on storage tank configurations and associated equipment through operator survey including tank type, function, age, gas throughput, etc.

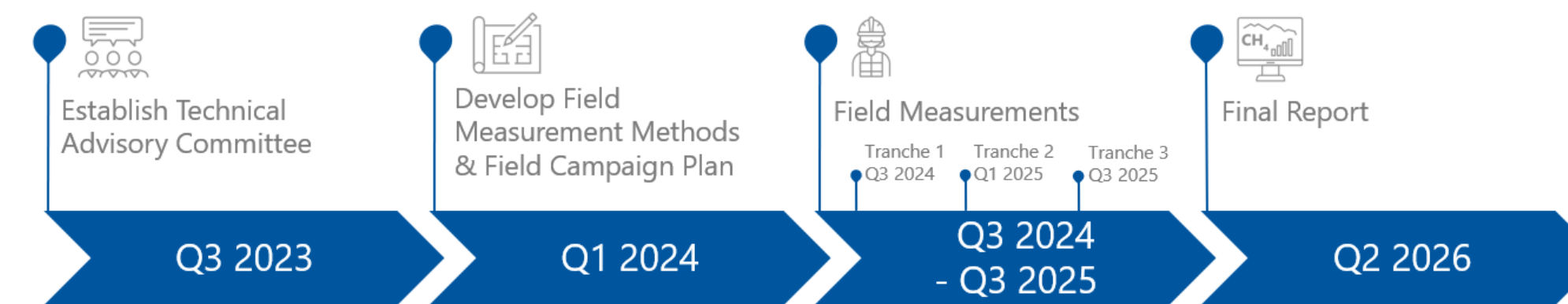
1. Develop emission factors for tanks that accounts for differences in basins, production types, age of facilities, and other variables.
2. Understand the causes, frequencies, and rates of intermittent emissions, and incorporate those results in emission factors or emission estimation methods.
3. Develop guidance on the effectiveness of tank monitoring and control systems for detecting and mitigating emissions.

Project Team



Technical Approach

- A traveling field team to visit about 750 storage tanks over the course of the project, making as-found or snapshot measurements.
 - The proposed plan includes 3 tranches, each sampling tanks with multiple operators per sector or basin to support anonymization.
- The same field team will also record operational survey data about storage tank battery configurations and associated equipment.
- Selected collection of gas and liquid samples will be conducted for modeling flash emissions in uncontrolled tanks.
- A separate field measurement with long-term monitoring systems to identify large emitters, emitter frequency, and intermittent emissions.
 - Measure 150-300 tank batteries throughout the project



Measurement Technologies to be Deployed

- Snapshot Measurements at 750 sites
 - OGI Camera + HiFlow 2 Sampler
 - QOGI Camera
- Long term monitoring at 150 sites
 - Imaging Camera
 - Point Sensor Network
- Sample Collection and Analysis at up to 100 randomly selected sites
 - GPA 2166 (gas sampling method)
 - GPA 2261 (gas analysis through hexanes plus)
 - GPA 2174 (pressurized liquid sampling)
 - GPA 2103 (pressurized liquid analysis)

Benefits and Value

- Independently generate new measurement-based methane emission factors for upstream storage tanks of different configurations and in different regions.
- Final Deliverable – a DOE report and/or peer reviewed journal articles on the findings from the study, specifically methane emission factors at different regional scales based on the extent of sites that we get access to.
- Provide guidance on the effectiveness of monitoring and control methods which is perhaps the most actionable for operators as well as having the most direct path to mitigation.

DEIA Plan and Community Engagement

- Principles
 - Transparency and Communication
 - Partnership and Collaboration
 - Accountability and Reporting
- Strategies
 - Create and engage a network of community-based users
 - Create accessible and useful visuals to represent project information
 - Increase Minority Serving Institutions (MSI) accessibility to maps and public data
 - Diverse recruitment of interns, associate engineers and associate scientist positions with training on DEIA and Environmental Justice (EJ)

GTI Energy IM4 Website



With funding from the U.S. Department of Energy's Innovative Methane Measurement, Monitoring, and Mitigation (iM4) program, GTI Energy is leading three projects to advance the development of accurate measurements and tools that are designed to accelerate effective strategies to mitigate methane emissions. Our mission is to lead the charge in the accurate measurement and effective mitigation of methane emissions. Recognizing the Department of Energy's efforts to reduce methane emissions to reach the climate goal of a zero-emissions economy by 2050, we are dedicated to developing cutting-edge measurements and tools that empower industries, policymakers, and communities to take proactive steps toward emission reductions.

VISION
Our vision is a world where methane emissions are accurately quantified, leading to effective mitigation strategies that will significantly benefit the environment. Through our efforts in the development of measurement-informed emission inventories and innovative tools, we aspire to set a standard for comprehensive methane management both locally and globally.
The project vision will be updated annually to incorporate stakeholder input, as well as the latest research, policy developments, and technology advancements.



2024 Next Steps

- Recruitment of operator partners for site access – Tranche 1
- Field Campaign Planning – Tranche 1
- Field Measurement Protocols – Tranche 1
- Measurement Method Deployment – Tranche 1
- Community User Group Meetings
- DEIA & EJ training for summer intern

Contact Information

- Scan the QR code to visit GTI Energy's iM4 website
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