Collaboratory to Advance Methane Science

Funding Opportunity

Model for Developing a Spatial and Temporal Methane Emissions Profile for Oil and Gas Basins

Announcement Details:

The Collaboratory to Advance Methane Science (CAMS) is seeking responses to a funding opportunity to develop a model or methods for improving understanding of spatial and temporal regional methane emissions profiles with a focus on oil and gas sources in key basins. Responding entities should submit full proposals for projects by November 16, 2018 5PM EST. It is anticipated that one award will be made with funding ranging from $200,000 to $500,000. It is also anticipated that a larger Phase 2 field study would be awarded in the future.

Primary Study Objectives:

Enhance understanding of spatial and temporal methane emissions profiles across various oil and gas basins. This could be achieved through the development of a model or other methods to characterize emissions. The model or methods should have sufficient detail of emissions sources and control parameters to be capable of informing emissions mitigation options. The model or methods will be used to develop future field measurement campaigns optimized for improving the mechanistic understanding of methane emissions. Specific study objectives include:

1. Review and harmonize past measurement studies to support developing representative emissions distribution profiles over a specific time period (24 hours for example)
2. Identify technical and data gaps needed to support the development and/or validation of the model or methods
3. Develop a robust spatial and temporal emissions model or approach that accounts for industry practices at the time of measurements. The model or method should be capable of providing guidance for future field study designs and for use in identifying effective mitigation strategies
4. Provide recommendations on data gaps that could be filled during a future Phase 2 field measurement study effort to validate the model

Background:

The natural gas and oil industry has a long-standing commitment to understanding and continuously improving its environmental performance based upon scientific knowledge. Decades of prior collaborations have resulted in an improved understanding of emissions. CAMS will build on this success to continue to advance the science around methane emissions by sponsoring and engaging in research to develop innovative approaches to allow for a deeper mechanistic understanding of emissions that can result in more effective emission reduction strategies.

In the past few years, many field studies have been conducted with the objective of quantifying methane emissions from oil and gas operations in the United States. These studies have used

varied measurement approaches, including ‘top down’ aircraft measurements, mobile lab-based ground-level downwind atmospheric measurements and on-site source measurements with varying temporal and spatial scales. Many of these studies have existed as a standalone analysis and researchers have derived regional or national emission profiles from the individual studies. While useful for developing regional and national GHG inventories, these estimates are often based on annualized average emissions and rely on sampled measurements that represent a single snapshot in time. When quantifying emissions and identifying opportunities for reduction for individual operators these studies are limited and may not capture other factors contributing to overall emissions such as episodic sources and other less characterized sources such as marginal or abandoned wells, or non-O&G sources.

Current methods of estimating emissions are often built on assumptions that emissions from a source are constant and rely on statistical models that may carry large uncertainties. To reduce such uncertainties, a model that accounts for episodic sources of emissions as well as operational and maintenance activities is needed for developing emission profiles that can be applied at varying scales (regional, facility level). This type of approach would improve the characterization of emissions from oil and gas facilities as it would include a temporal resolution that may not be considered in national and state emission inventories. A temporal model could also account for time varying emissions such as liquid unloadings. A better understanding of these types of episodic emissions will improve the quantification of emissions, reduce overall uncertainty, and provide guidance on how to reduce them. Such models might also identify the most effective approaches for mitigation that could be basin specific, given the differences in reservoir gas compositions, oil/gas ratios, equipment requirements, well production volumes, operational practices and other basin-specific variables across the U.S. Furthermore, such models and analysis could provide guidance for identifying specific data gaps and provide information for designing efficient and adaptive field studies to improve the mechanistic understanding of methane emissions.

The technical approach for developing the spatial and temporal model should consider the following:

- Leveraging approaches and data from past relevant methane measurement studies from oil and gas sources
- Utilizing historical records from individual operators of episodic events or operational and maintenance practices that can inform observed measurements in previous studies
- Identifying sensitivities of the impact of key variables (e.g. episodic events, marginal wells, GOR, age of the basin, urbanization)
- Obtaining activity data of key emission sources (including non-oil and gas such as biogenic sources) from state and/or federal data sources (e.g. EPA GHGRP, state inventories, Canadian and European inventories), including sources with limited data such as marginal wells, urban emissions etc.
- Determining the impact of utilizing multiple measurement techniques (fixed sensors, mobile platforms, continuous measurements) used in prior studies to collect emissions data

Deliverables

- Report summarizing harmonization of past studies, including a list of variables/data gaps that should be considered in Phase 2
- Develop a robust methodology and a model to develop spatial and temporal methane emissions profiles for O&G emission sources for a generic basin in the USA.
- Publication of results of data analysis as a scientific journal article
- Recommendations on a Phase-2 field study and a framework (or basis) of design for a generic gas basin in the US.

Proposal Schedule and Submission:
RFP Release Date: October 19, 2018
Deadline to submit proposals: November 16, 2018 5PM EST
Submit proposals to: Kristine Wiley at Kristine.wiley@gastechnology.org
Anticipated Award Date: December 2018
Anticipated Project Start Date: January 1, 2019
Anticipated Period of Performance: 9 months

Available Funding: $200,000 to $500,000, no match funding required

Questions on the funding opportunity should be directed to:

Kristine Wiley
GTI
CAMS Program Administrator
Kristine.wiley@gastechnology.org

Eligibility

The solicitation is open to public and private entities. The successful contracting group should consist of a team of experts with data analysis and statistical experience and field design and execution experience at oil and gas operations.

Proposal Package Requirements

Point of Contact (Name, Title, Business Address, Phone, email)
Executive Summary (project description, team members)
Scope of Work (goals, objectives, technical approach and methods to be used, task level descriptions, deliverables and milestones)
Budget (breakdown by task, labor, M&S, subs, consultants) – contract will be time and materials based, not to exceed maximum funding amount, labor rates should be included in proposal
Schedule
Team Qualifications (include relevant work and publications, similar past projects, resources and capabilities)
One page public project summary (will be used if awarded)
Proposal should not exceed 20 pages

Evaluation, Award and Contracting Process

The project will be evaluated based on the following criteria:

Scientific and Technical Merit (30%)

- Relevance and Response to RFP
- Clear description of how goals and objectives of RFP will be achieved
- Understanding of technical/scientific problem, challenges, limitations of the current state of knowledge or technology relative to addressing the problem based on RFP response
- Research approach is based on sound scientific principles
- Demonstrates that the proposed research is not duplicative of current research

Technical Approach and Understanding (30%)

- Appropriateness, clarity, and completeness of the technical approach and rationale for each task
- Clearly describes how tasks will be executed and coordinated
- Adequacy and availability of facilities and equipment and skill sets required to perform project
- Identifies critical factors to success, risks, challenges, limitations

Qualifications, Experience and Capabilities (20%)

- Has identified an appropriate team/organization chart to achieve success and meet technical objectives
- Has program management skills appropriate for the project
- Summarizes qualifications of team and key personnel
- Describes facilities, equipment, resources that will be used for project
- History of completing similar projects and/or collaborations with team partners
- Has a history of meeting deadlines and achieving objectives

Budget and Cost Effectiveness (20%)

- Reasonableness of proposed budget relative to the project goals, objectives, and tasks
- Includes breakdown of budget by labor, materials, equipment and travel

The project will be awarded, contracted and managed by the CAMS program administrator, GTI. The project will engage with a technical committee and steering committee which will include members of the industry sponsors, the PI's study team and the Project Manager. The contractor will also have access to an independent review by the CAMS External Scientific Advisory Board.