

Methane Detection Technology and Certified Natural Gas

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Roy D. Hartstein



Methane detection technology

▶ Goals of detection

1. Find fugitive emissions
2. Eliminate the source
3. Generate knowledge through data and
4. Develop preventative measures

Methane detection technology

- ▶ Detection considerations
 1. Cost
 2. Effectiveness in the deployed environment
 3. Detection limits
- ▶ Super-emitter detection
- ▶ Source level detection

Satellites, drones and continuous monitors

- ▶ Technologies (Semiconducting and optical sensors)
 - ▶ Metal oxides
 - ▶ Light Detection And Ranging (LiDAR)
 - ▶ Tunable Diode Laser Absorption Spectroscopy (TDLAS)
 - ▶ Satellites
- ▶ Advantages / disadvantages
- ▶ Limitations
- ▶ Future development

What technology?



West Texas

West Virginia



Project Astra

- ▶ West Texas Methane Showdown
 - ▶ Testing multiple sensors with different detector types
 - ▶ Sensor mesh network
- ▶ Digital Methane Challenge
 - ▶ Creating a digital model of a pilot area in the Permian
 - ▶ Digital model to set up an “ideal” mesh network
- ▶ Project Astra
 - ▶ University of Texas, EDF, GTI, Exxon Mobil, Pioneer Natural Resources
 - ▶ Project scheduled for 2021 and 2022

Canadian Research

- ▶ Learning from Fugitive Emissions Management Program (FEMP)
 - ▶ The top 5% of emitters contribute between 35% and 68% of emissions
 - ▶ Oil site emissions are 2X gas site emissions
 - ▶ Over 70% of emissions are from venting
 - ▶ Methane detection (LDAR) can reduce emissions – depending on repair
 - ▶ Tanks and pneumatics are the largest sources
 - ▶ Tanks contribute as much as 56% of emissions

Momentum for “more sustainable” gas production



May 2018:
First “responsible gas”
transaction



Oct 2019:
Methane focused supply
chain transaction



2020: Incorporating
responsible gas in
procurement standards

North America

Inputs to methane emissions certification

One measure is not enough

1



Methane Intensity

$$= \frac{\text{Methane emitted}}{\text{Methane produced}}$$

< threshold %

2



Culture

Implementation
of best practice
policies and
procedures

3



Technology

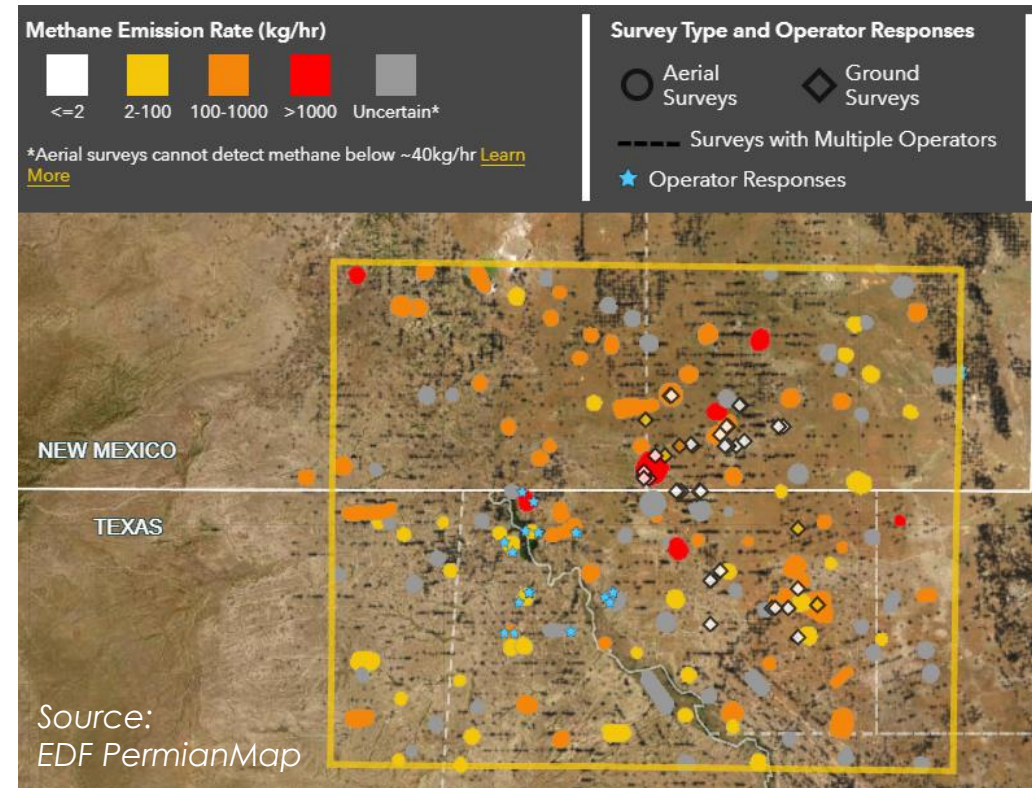
Robust
deployment of
monitoring
technology

Certification

Role of Technology

Objectives of technology deployment for Certification:

- Increase the identification (and repair) of unintended sources (including super emitters)
- Provide assurance against calculated methane intensity by identifying leak sources
- Encourage better operating practices and equipment design for reduced emissions internally and amongst industry
- Work towards a better understanding of quantification techniques



The measurement-based estimate is ~ 3 times higher than the EPA inventory for the Permian Basin.

Important Elements of Certification

- Credible certification agency
- Transparency of standard
- Auditor independence
- Auditor certification





Responsible Energy
SOLUTIONS