

Methane Emissions Mitigation Technology and Innovation

Oil & Gas Subcommittee Webinar

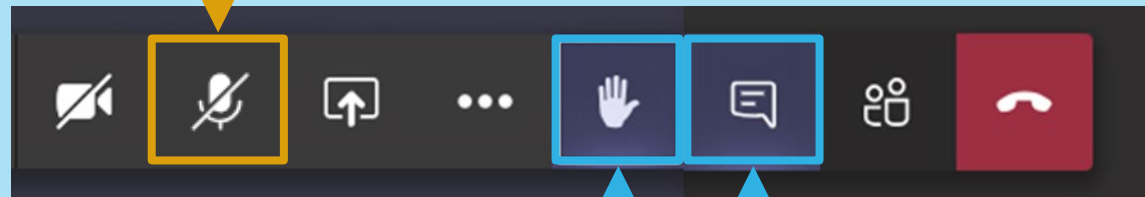
23 September 2020



Housekeeping – Tips for using Teams

Mute your microphone.

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Help!

Need Help?

If you need help, please send an email to asg@globalmethane.org

Agenda

- **Welcome**
 - James Diamond, GMI O&G Subcommittee Co-Chair, Environment and Climate Change Canada (ECCC)
- **Background on Methane Emissions Leadership Alliance (MELA) & Introductions**
 - Jackson Hegland, Executive Director, MELA
- **Presentation from Calscan Solutions, “Keeping the Sky Blue”**
 - Henri Tessier, Managing Partner, Calscan Solutions
- **Presentation from Clear Rush Co., “Clean Combustion Technology”**
 - Dallas Rosevear, Chief Business Development Officer, Clear Rush Co.
- **Facilitated Discussion**
 - Jackson Hegland
- **Subcommittee News and Updates**
 - James Diamond
- **Wrap up and Adjourn**

23 SEPTEMBER 2020



Oil & Gas Subcommittee Webinar: Methane Emission Mitigation Technology & Innovation

Jackson Hegland, Executive Director
Methane Emissions Leadership Alliance





Setting the Stage



Converging Factors



Strategic Considerations



Opportunities



Best Practices



Case Studies



Contents

Converging Factors

- INVESTOR EXPECTATIONS
- POLICY & REGULATIONS
- SOCIAL PRESSURE
- INDUSTRY READINESS
- TECHNOLOGY AVAILABILITY
- FINANCIAL IMPACT



Why Methane?



RISK MITIGATION

Minimize the impact of future regulations and increasing stakeholder expectations.

ATTRACT INVESTMENT

Increasing demand from investors that ESG issues are properly managed to maximize returns.

Ensures Company “checks the box” if/when assets are sold or investment dollars are pursued.

CLEAN OPERATIONS

Regulatory compliance, minimize environmental impacts, safe workplace, community engagement are additional benefits of methane mitigation.

EMPLOYEE HABITS

Ensuring staff buy-in to methane mitigation streamlines compliance work.

Integrating methane into data & budget systems will build staff experience required in the coming years.



Strategic Considerations



Governance



Data Systems



Targets/KPIs

Equipment Inventory

Emissions Quantification

Opportunities



CLEAN COMBUSTION

Oil facilities with stranded gas - surface casing vent, tank top vent, pneumatics, compressors

COMPRESSOR VENTS

Vent gas capture back to sales or used for on-site fuel or sent to flare. Vent measurements important.

ELECTRIFICATION

Use of renewable power generation or low-carbon grid connect when available.

LEAK DETECTION

Identify fugitive leaks and vents using optical gas imaging cameras and other emerging sensor technology.

PNEUMATICS

Level controllers, pressure controllers, transducers, and chemical injection pumps.

TANK VENTING

Difficult to measure & capture but a large known source particularly at oil facilities.





Our Members





CALSCAN'S ENGINEERED SOLUTIONS

"Keeping The Sky Blue"





20 Years of Designing Measurement and Controls in Alberta



Downhole Pressure Loggers

Differential Flow Computer

Gas Turbine Flow Computer

Thermal Casing Vent Measurement

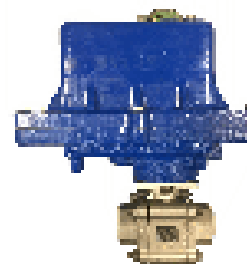
Hawk Vent Gas Meter
Development Started in 2011



Portable Measurement Skids



Solar Powered Linear Actuator



Electric 1/4 Turn Actuator
With Fail Detection



Zero Emission Separators

Measurement - Compressor Seal Vents and Pneumatic Devices



Hawk Vent Gas Meter low flow measurement

Back Pressure: <2.0 inH₂O total @ 250 scf/hour

Range Ability: From 0.014 to 170 am³/day

Total Flow Accuracy: ±2%

Flow Resolution: 0.000708 m³

Power Consumption: 3.5vdc lithium battery

Outdoor Rated: -40C to 60C

Hazardous Location: IS Class 1 div 1

Operator Friendly: Light weight

Reporting Software: Data logging

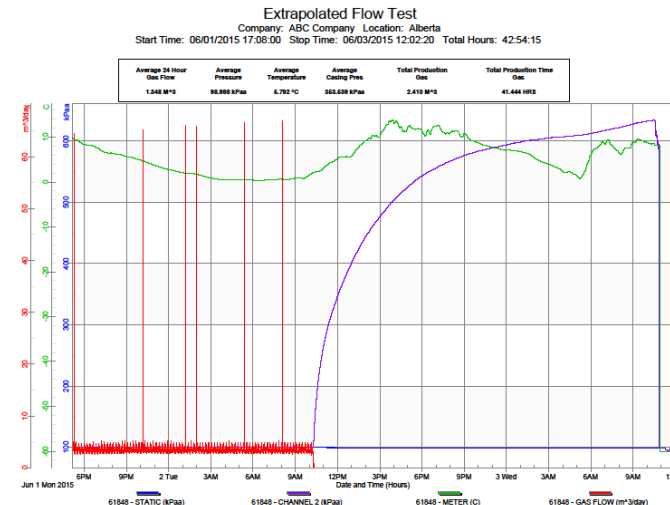
Cost: Available for Rental or purchase



Connections - location, safety.



Can it be used in a building where its Div1/Zone1(0) ?



You're going to need to log and graph the data



CALSCAN'S Bear Electric Controls Zero Emission Separator



Brownfield - Replacing Pneumatics Devices with Zero Venting Low Power Bear Electric Controls



Steps to consider for retrofitting

Carbon Credits till 2028

- Inventory of each pneumatic device
- Require to measure each instrument
- Reports / Audit / Cost

Well site location

- Maintenance Issues (Wet/Sour/Dirty fuel gas)
- High Venting from Pneumatic devices (>0.17 m³/hr)
- High bleed to low bleed pneumatic devices

Instrumentation Equipment Replacement

- Valve Replacement
- Choosing the correct electric actuators
- RTU upgrading / Programming
- Installation

Power Requirements

- Power on site? (Solar/TEG/Grid Power)
- Power budget
- Chemical pump addition

Cost



Before



After

Back Pressure Control Valve



Before



After

Inlet Pressure Control Valve



Before



After

Level Controllers



Before



After

Level Control Valve

Greenfield - Zero Venting Low Power Bear Electric Controls

“NEW INSTALLS”



AER D60 Regulation compliance

No Instrumentation concerns with bad fuel gas
(wet, foamy, sour fuel gas)

Low Power Actuators

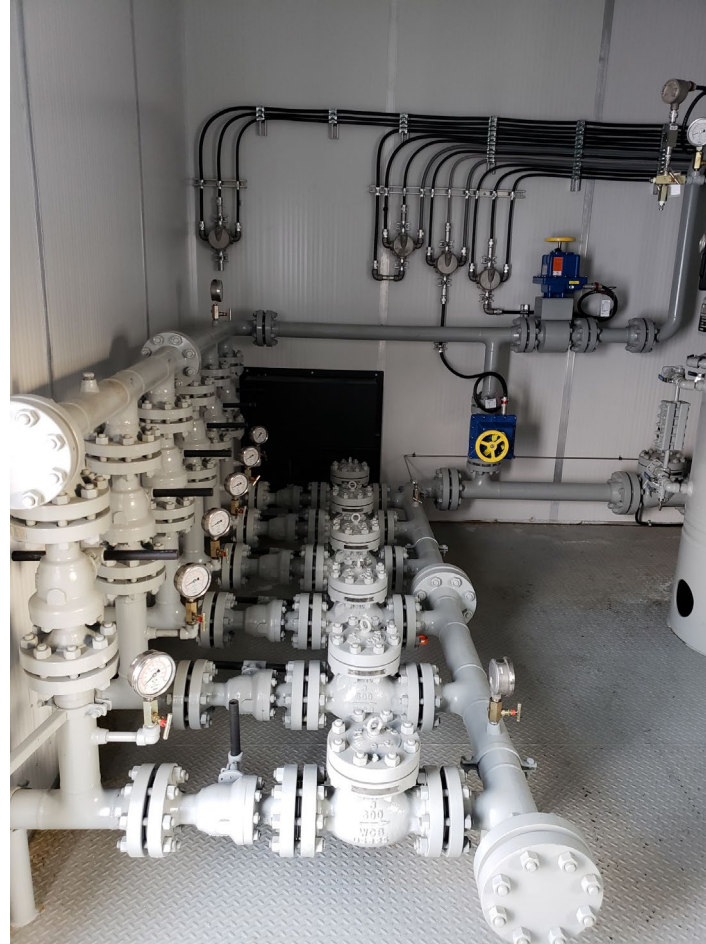
Operational Excellence with less maintenance

Feedback from all electric controls

Wellsite optimization such as Artificial
Intelligence (A.I.)

One power budget

Cost



“NEW” all Electric Oil Well Test Separator



EMISSIONS
REDUCTION
ALBERTA

RESEARCH AND DEVELOPMENT

Awarded \$1.94 MM grant to develop & deploy 50W fuel cells



Calscan Patent
Bear Electric ESD
and Patent Power
Fail Safe Modules



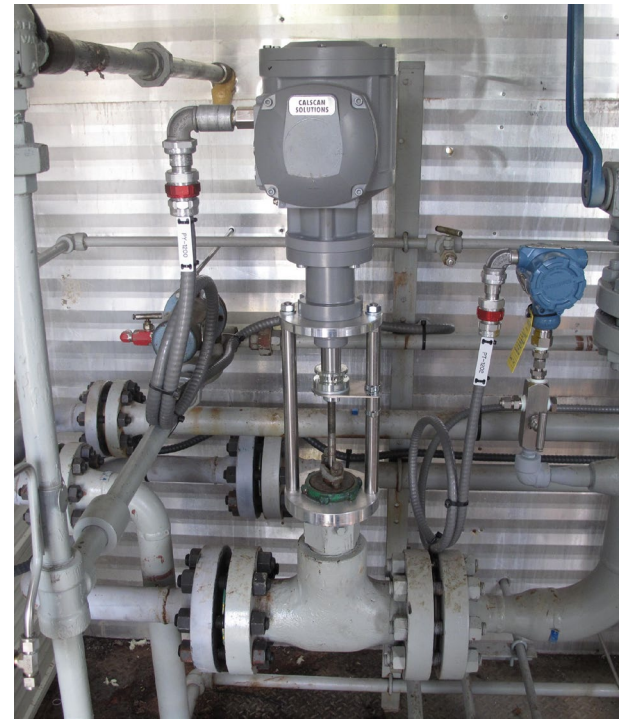
50 Watt Fuel Cell,
Operates on Industrial
Methanol



Calscan Bear Solar
Electric Well Control
System



Canadian O&G
Partners



CALSCAN'S ENGINEERED SOLUTIONS

"Keeping The Sky Blue"

Questions ?



Henri Tessier
Partner

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780-944-1377



Presented by:
Dallas Rosevear



Clear Rush Co.
A Clean Technology Group

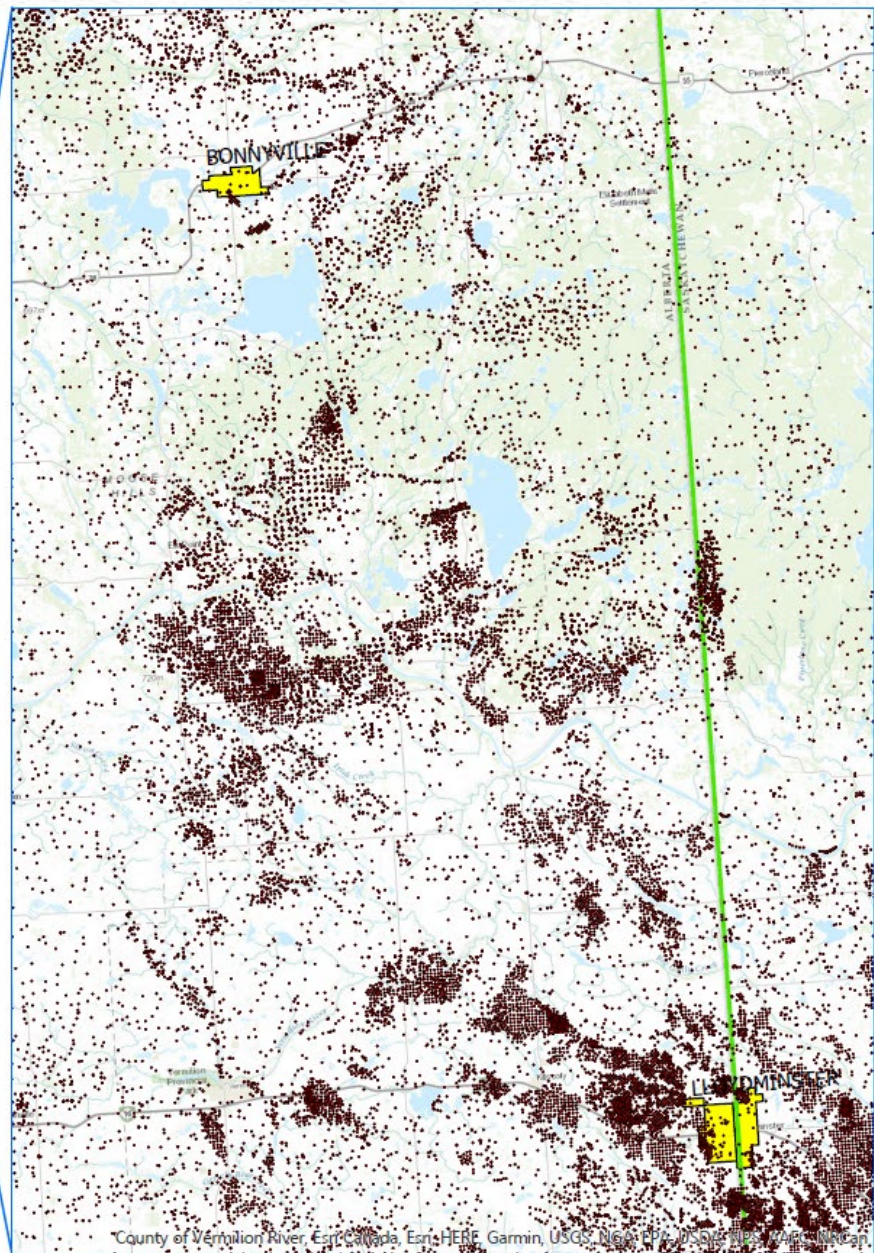
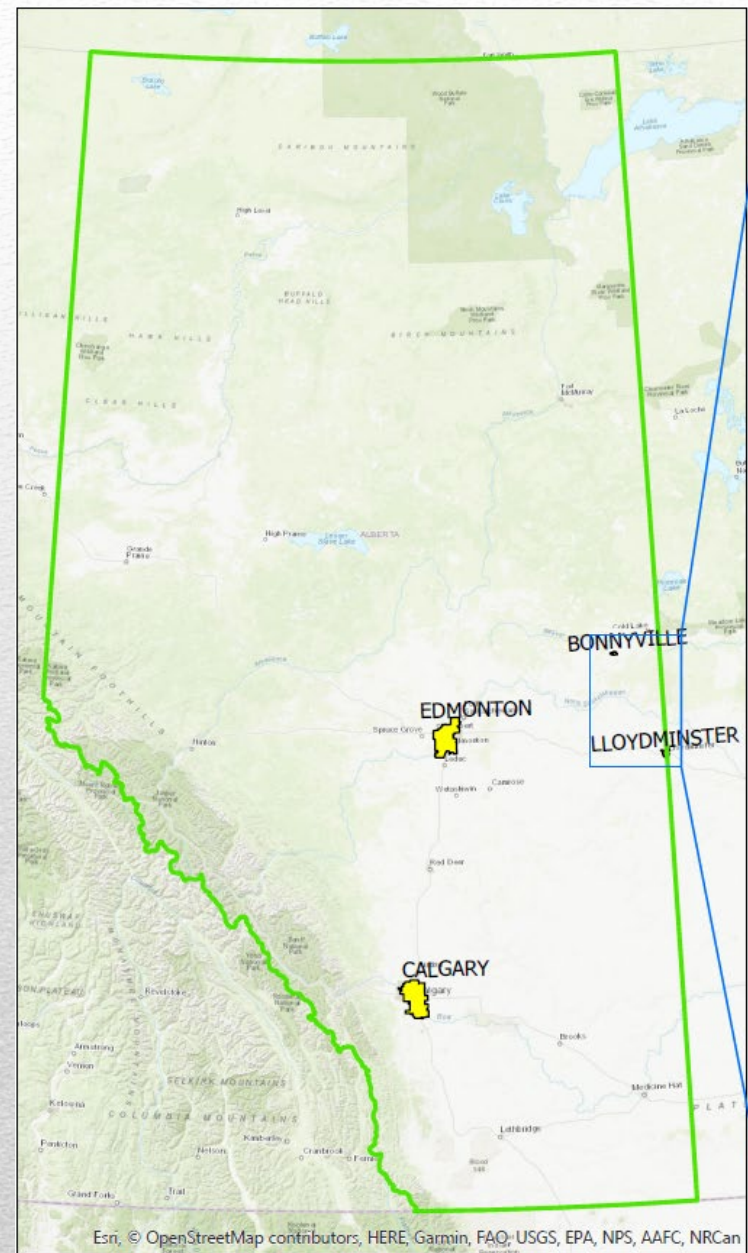
Clean Combustion Technology

Why Are We Here

- ❖ Global Energy sector must produce energy in an environmentally sustainable manner
 - ❖ Identify and promote new clean technologies
 - ❖ Highlight applications for new technologies
 - ❖ Learn how new methane reduction technologies can actually provide ROI
-

Air Quality = Climate Change

- ❖ CO2 very difficult and expensive to deal with
 - ❖ Methane is 25 times more potent than CO2
 - ❖ Focus on the “easy stuff” or “low hanging fruit”
 - ❖ ROI provides funding for continued R&D
-



What We Do

Clear Rush Co is a combustion technology company which has developed a complete line of patented methane reduction technologies.

Clear Rush Co Enclosed Vapour Combustors (EVC's) produce no visible flame or smoke and achieve > 99% total hydrocarbon destruction without any additional energy requirements.

With the Clear Rush Co products you can eliminate all V.O.C's, BTEX's and Methane from your wellsite, multi-well battery or facility resulting in the elimination of soot, black carbon, and smoke which would typically be the result of flaring.

Any uneconomical gas which is vented to atmosphere or sent to a flare stack is eliminated using the Clear Rush Co technologies and is able to generate a ROI.

“Conservation is king” whenever possible; conservation of vent gas is the preferred method.

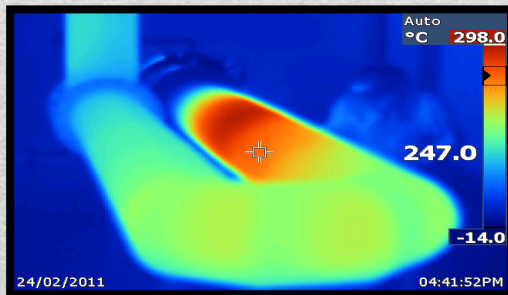
Enclosed Vapour Combustors

- ❖ Cleanly combust un-economical vent gas
- ❖ Easily handle low pressure intermittent flows
- ❖ Produces no visible flame or smoke
- ❖ 99.99% total hydrocarbon destruction as low as 1.5 ounces
- ❖ Can use waste gas for pilot gas
- ❖ Solar Powered Operation
- ❖ CSA approved, B 149.3 compliant, ACL ignition control system

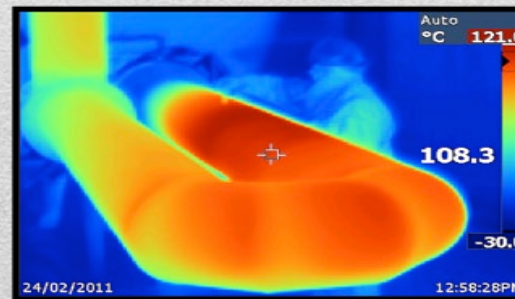


Pre-Assembled Rush Burner Packages

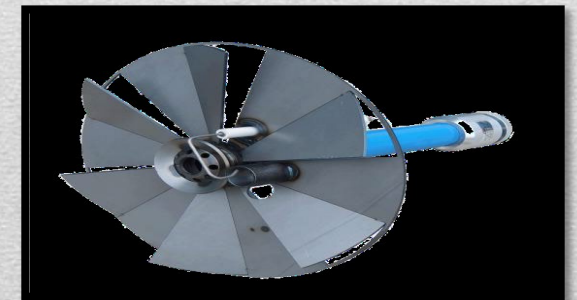
- ❖ All in one combustion solution for storage tank heaters, line heaters, de-hy's and treaters.
- ❖ Greater than 80% efficiencies vs. typical burners 60%
- ❖ Total hydrocarbon destruction of 98%
- ❖ Reduces fuel gas usage by 25% (third party verified)
- ❖ Destroy harmful BTEX
- ❖ Use existing vent gas onsite to provide process heat



Typical Burner



ACL Burner



Patented High Efficiency Burner

Measurability



(1) BGR 36 LP Combustor



365 Days



3,650 Cars Off The Road
Per Year

Rush Power

Sterling Engine Technology

1000 continuous watts

11m³/d vent gas

Onboard battery storage



Benefits of CRC Products

- ❖ Emission Reduction even in low commodity price environment
 - ❖ > 99% Efficiency
 - ❖ Eliminate Odors, Smoke, Black Carbon
 - ❖ Eliminate Methane, V.O.C, BTEX venting
 - ❖ Utilize waste vent gas from site for process heat
 - ❖ Extremely low operating costs
 - ❖ Extremely low installation costs
 - ❖ ROI vs operational costs
-



**Thank you for the opportunity to present our
*Clean Combustion Technology!***

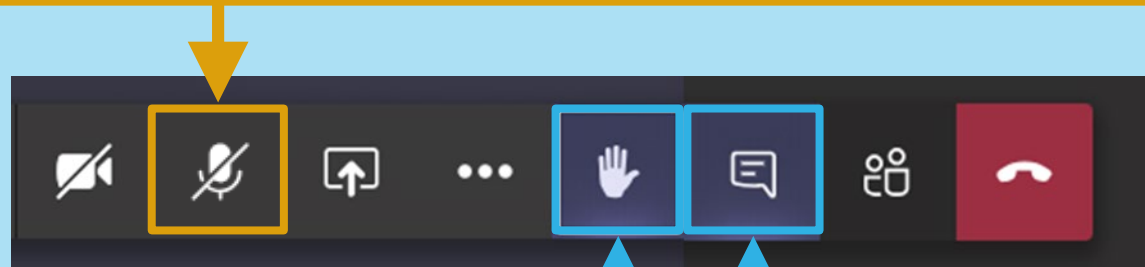
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Questions?

Question and Answer

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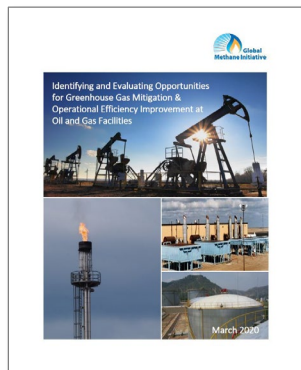
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GMI Oil & Gas Subcommittee News and Updates

- **Join us for the GMI O&G Subcommittee Virtual Meeting in October**
 - The virtual meeting will focus on Oil & Gas Subcommittee business items, including a review of 2019-2020 Subcommittee accomplishments and priorities, as well as a working session to examine and update the Oil & Gas Action Plan.
 - Information about the virtual meeting will be posted on the GMI website as it becomes available.
- **Stay tuned for details about the next technical webinar!**



French translation of GMI report now available:

Identifying and Evaluating Opportunities for Greenhouse Gas Mitigation & Operational Efficiency Improvement at Oil and Gas Facilities

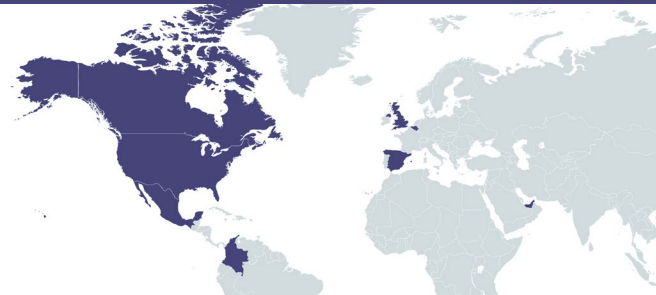
Global Methane CHALLENGE

80 Stories from 23 Countries



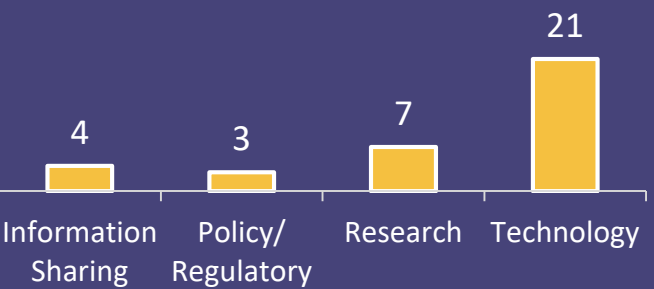
-- including --

35 Oil & Gas Stories



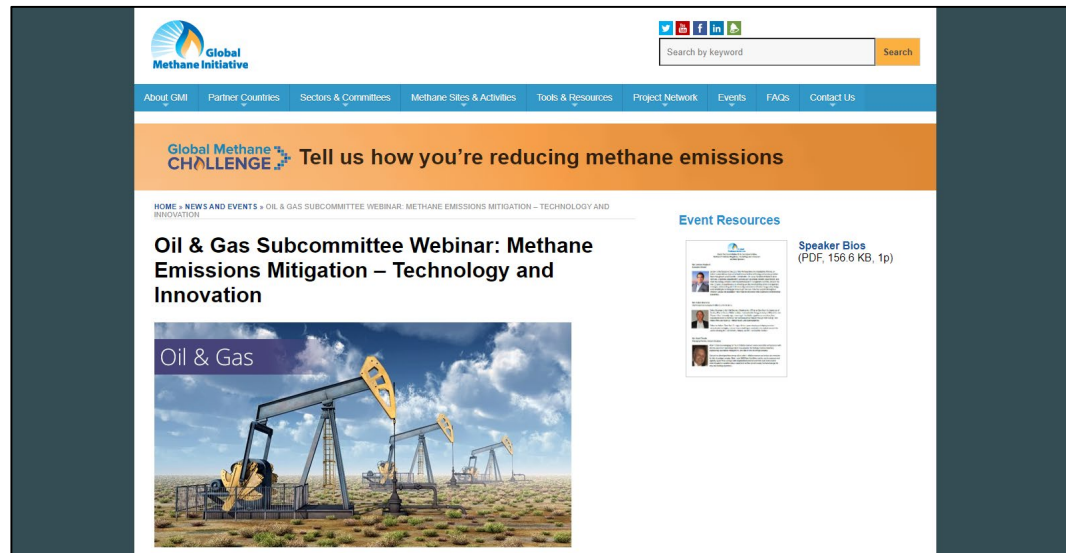
- The Global Methane Challenge is still open!
- Launched in 2019 to raise awareness and catalyze ambitious action to reduce methane emissions

Submit your story at globalmethane.org/challenge/



Wrap Up

- A recording of today's webinar and the presentations will be posted on the GMI event page soon



Reminder

We welcome your feedback!
We encourage you to share suggestions for future webinar topics by emailing us at asg@globalmethane.org.

Thank you for participating today



“See you” at the next webinar!