

CANADA EMISSIONS REDUCTION INNOVATION NETWORK (CERIN) PUBLIC REPORT

1. PROJECT INFORMATION:

Project Title:	Metan Etter Catalytic Oxidizer – FIELD TEST
Emissions Reduction Scope/Description:	TI unit to a low rate venting well in Saskatchewan, estimated rate of 25m ³ /d to match name plate capacity on CMAS unit.
Applicant (Organization):	Teine Energy Ltd.
Project Completion Date:	March 31, 2023

2. EXECUTIVE SUMMARY:

Overall, the test was very successful. Maximum name plate capacity rate of 25m³/d was observed and the unit had great run times despite harsh winter conditions in Saskatchewan. Operations were impressed on how easy the unit was to operate, as compared to a combustor. There was virtually no pressure drop thru the unit which makes it very advantageous for applications to pressure sensitive oil wells. The oxidization process makes this unit safe to operate and allows significant savings on installation with no spacing requirements.

Commercial manufacturing of the unit could yield GHG Capital metrics in the \$65/T-CO₂e range. This unit has potential to be a commercial option to help Producers achieve their 75% methane reduction target for 2030.

3. KEY WORDS

Add up to 5 key words

Oxidizer, Safe, Venting, Spacing, Efficiency



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4. APPLICANT INFORMATION:

Applicant (Organization):	Teine Energy Ltd.
Address:	3000, 520 – 3 rd Ave SW, Calgary, AB T2P 0R3
Applicant Representative Name:	Tyler Homan
Title:	VP Production & Operations
Applicant Contact Information:	thoman@teine-energy.com Office: 403-592-6226

5. LEAD CONTRIBUTING PARTNER INFORMATION:

Organization:	PTAC / Metan Etter (Metan Group & Etter Engineering) / SRC
Address:	
Representative Name:	Brian Spiegelmann / Jon Moore, John & Julian Nurkowski, Tom Etter / Erica Emery
Title:	

6. PROJECT PARTNERS

PTAC participated in the project by providing 50% of the project funding, rental and installation. Etter Engineering and the Metan Group provided the Metan Etter unit for testing.

A. INTRODUCTION

Teine is seeking equipment that can address the next tier of low rate vented wells 50 – 200m³/d. Combustor manufacturers have targeted the 500 – 900m³/d vented range, however the units are not cost effective and have operational challenges (lose ignition) at lower vented volume range.

The Metan Etter Catalytic Oxidizer was capable of destructing 25m³/d, with approximately 85% efficiency (SRC Tested, methane only). The unit was flameless and spacing could be placed in close proximity of the wellhead, thereby reducing installation costs significantly. The oxidization design makes the unit safe and operator friendly. Teine embarked on testing the unit in a Saskatchewan winter to understand limits and operational efficiency.

A rental contract was negotiated in November of 2022 and the unit was operational on January 15, 2023. The test trial would run over the course of the winter, ending March 31, 2023. Operations staff would be doing daily checks and monitoring performance indicators: Oxidization Temp, Gas Thruput, and Run Time. The unit remains in service today and will be purchased outright by Teine given its success to date.



B. METHODOLOGY

Please provide a narrative describing the methodology and facilities that were used to execute and complete the project. Use subheadings as appropriate.

The unit was installed on a low rate vented Viking oil well around Kindersley, Sask. The vented gas was measured at approximately 25m³/d (roots meter), which matched up with the name plate capacity of the Metan Etter CMAS-1L.

The placement of the unit should be any suitable distance that does not interfere with artificial equipment, well servicing or impede well operations. For the purpose of the trial we wanted to keep the same distance as our double walled combustor units (10m), to ensure MER compliance and a safe distance from the wellhead being a unit never operated before. The unit did not come ready for field service and some necessary upgrades were done at the time of install by an electrical contractor – heat trace primarily and upgraded junction boxes (explosion proof) to meet code. A base was also constructed to hold the unit. Total installation cost with material and labor was approximately \$17K. Additional costs for transportation and brokering were \$2K.



C. PROJECT RESULTS AND KEY LEARNINGS

Please provide a narrative describing the key results using the project’s milestones as sub-headings.

TESTING/OBSERVATIONS

Unit was commissioned for service January 14, 2023. Following performance indicators were monitored and recorded.

MONTH	RUN TIME % (24hr Day)	Oxidizer Temp (°F)	Daily Ave Gas (m3/d)	Comments
January	93	268	11	Regulator was not set up to achieve max thruput.
February	100	272	20	Regulator was changed out early Feb, as discussed with Etter.
March	91	260	22	Some downtime with winter storms and high winds.

Operator Observations

- Easy to start and operate.
- Low back pressure, 1 – 2psig on casing, wont impede well production. IMPORTANT!
- General comment is the unit was much easier to operate than a combustor.
- Wind did affect the performance of the unit with observed Oxidizer Temps fluctuating, but it stayed running for the most part.
- Heat trace was necessary to prevent freezing, however might be mitigated with closer move to wellhead.

D. PROJECT AND TECHNOLOGY KEY PERFORMANCE INDICATORS

Organization:	Current Study	Commercial Deployment Projection
Project cash and in-kind cost (\$)	\$27,327 – GROSS PTAC invoiced for \$13,651(50%)	Q3/Q4 – 2024 (Commercial) 2023 Q3/Q4 – Confirm upgrades to unit. Capacity increase to 50 – 100m3/d.



Technology Readiness Level (Start / End):	Testing Passed - READY	Upgrades/Capacity – Late 2023
GHG Emissions Reduction (kt CH4/yr):	25m3/d – Viking Gas .025E3m3/d x 14.45T-CO2e/E3m3 x 365 = 132	85% - Destruction efficiency 112T-CO2e/yr reduction
Estimated GHG abatement cost (\$/kt CH4)	TEST: \$437/T-CO2e	COMMERCIAL: \$60 - \$70 /T-CO2e (achievable?)
Jobs created or maintained:	5? – Canadian Manufacturing	Metan Etter need to figure out a Royalty or Commission for Canadian Manufacturing branch.

NOTE – I used the metric Teine is currently using for abatement cost.

E. RECOMMENDATIONS AND NEXT STEPS

CMAS Oxidizer – Product Enhancements

- Equip unit with 12-Volt start system with 25’ battery cables to start, utilize Operator’s truck battery. Similar to Catadyne heaters. Will remove the need for permanent 120V power to start the unit.
- Increased wind protection(Upgraded Enclosure) to mitigate lost efficiency with cold. Fluctuating Oxidizer temps were a direct result of wind impacts inside the unit.
- Door latches need to be upgraded to more industrial grade.
- Industrial stand to be part of the unit, similar to one field constructed, will make for a quick installation.
- Increase size of unit to achieve 50m3/d, ideal range would be 50 – 100m3/d.
- Cost reduction measures: Galvanized steel shell, mass produce units to achieve some economies of scale.

Commercial Manufacturing

Metan Etter Group needs to establish Royalty or Licensing terms for a Canadian Manufacturer. This will provide some scalability and eliminate the cross border transportation/brokering. I believe that some of the existing Combustor vendors would be very interested in adding this unit to their product line. Based on a significant product order, of 100 or more units, this can be achieved. Teine needs line of sight to a new projected cost based on this size or order, yet to be determined. In the greater Kindersley area, there would be well over 1000 wells that could benefit from this technology to reduce venting. Could equate to over 200,000T-CO2e/year reduction at 50m3/d(Viking Gas).



