Final Summary Report

Project Title: Mitigating Low Volume Methane Emissions
Researcher: Saskatchewan Research Council (SRC)
Project Technical Champion: Lindsay Campbell, AER
GL#: 16-ARPC-05
Peer Review Planned? ☐ **Yes** ✓ **No**
Final Report Submission Date: December 23, 2016

Executive Summary of Project Findings

In Phase 1 of the project SRC has provided an updated technology scan of methane mitigation technologies, and recommended top two technologies which would be the most likely to succeed and that are at a point suitable for commercial validation. Phase 1 was completed on December 31st and had a budget of $25,000.

The milestones and results achieved to date include:

- **Background research on methane emissions and regulations:** a literature review of methane sources, emission levels in the oil and gas industry, and methane emission regulations in Alberta and Saskatchewan.
- **Literature survey of methane mitigation technologies:** a literature review and website scan for methane mitigation technologies has identified a dozen unique approaches.
- **Investigate options in more depth:** Details about the principle of operation, applicable flow conditions, and approximate costs for each technology have been determined.
- **Develop screening criteria to determine top choice(s):** The methane mitigation technologies were screened based on capital cost, greenhouse gas reduction, range of applicable flow rates, distance to product end user, and ability to handle impurities such as H_2S.
- **Shortlist of methane mitigation technologies:** For this project we are mainly interested in technologies which can be applied to low flow, stranded, potentially sour associated gas. A screening criteria table was used to determine a shortlist of 4 contenders in the area of interest.
- **Further analysis to determine top two choices:** A basic cash flow analysis was applied to reduce the shortlist to the top two technologies with the best potential to succeed at a commercial level: tanks covers and methanotrophic biofilters.
- **Final report:** A final report that summarizes the research and findings of this project has been delivered to AUPRF.

PTAC
Petroleum Technology
Alliance Canada
Suite 400, 500 Fifth Ave. S.W.
Calgary, Alberta T2P 3L5
phone: (403) 218-7700
fax: (403) 920-0054
email: info@ptac.org
web: www.ptac.org

Project Outcome / Impact

Table 1 and Figures 1 and 2, below, are a summary of the report findings. More information about methane mitigation technologies is provided in the report. This information can be used by industry to investigate methane mitigation options.

Table 1: Summary of methane mitigation technologies and their capabilities

Technology	Capital Cost (USD)	Minimum flowrate (m^3/d)	Maximum GHG reduction	TRL	Distance to end user	Impu-rities
LDAR	$1K-$10K	—	100%	10	Close	Good
VRU	$30K - $120K	140-3,100	100%	10	Close	Poor
Pneumatics replacement	$1K-$10K	4	50-100%	10	Close	Good
GTG	$10K-$50K	367-1,140	100%	10	Close	Poor
LNG	$683K	9,000	100%	10	Moderate	Good
GTS	~$512K	Unknown	Unknown	4	Moderate	Poor
Gas bladder	$100-$1K	0.5-100	100%	10	Close	Good
Tank covers	$4.6K	<900	5%	10	N/A	Good
Flare	$21K-$94.5K	48	89%	10	N/A	Good
Electronic ignition flare	Additional $5K	48	89%	10	N/A	Good
MBF	$15K	0-140	89%	4	N/A	Moder ate
RTO, CTO	$53MM-$190MM	141,200	89%	10	N/A	Moder ate
GTL	$4MM-$6MM	1,000	100%	10	Moderate	Moder ate
GTC	$1MM	2,300	100%	8	Moderate	Moder ate
GTW	$158K-$479K	500-3,100	89%	10	N/A	Moder ate

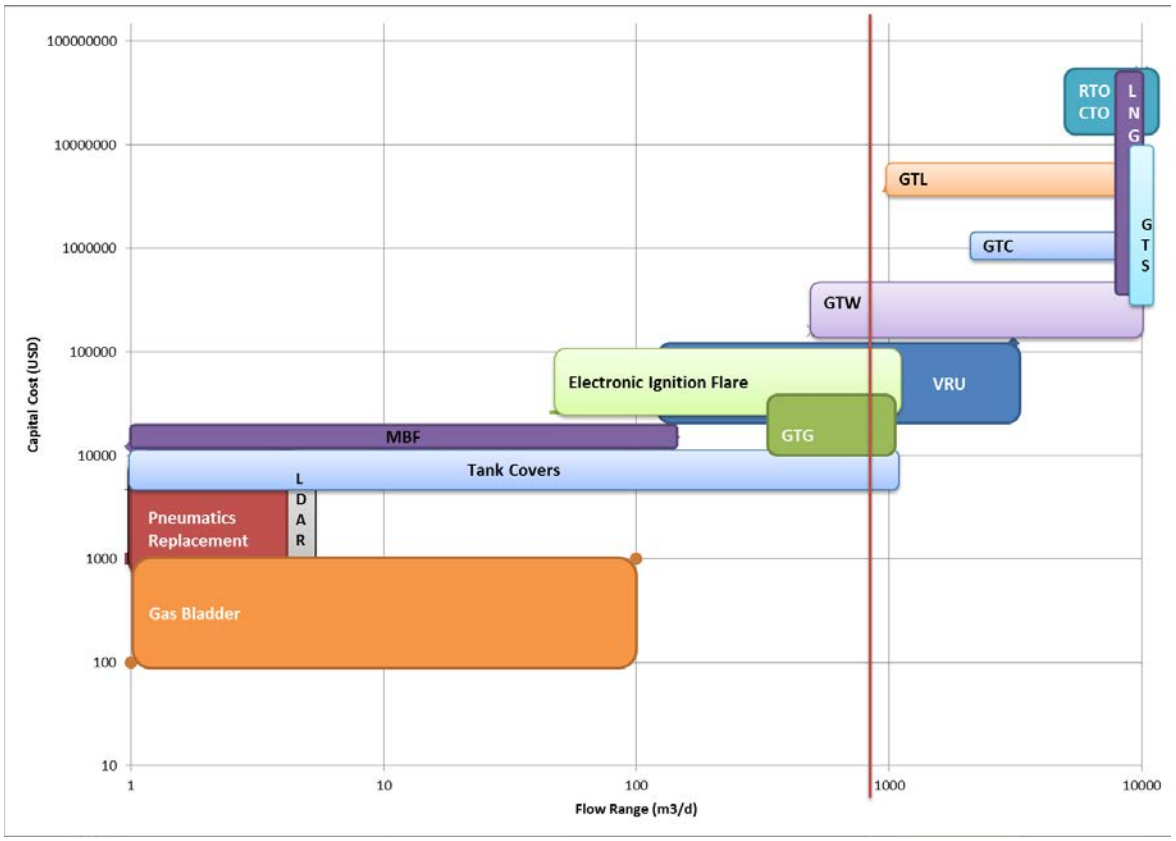

Figure 1: Methane Mitigation Technology Options

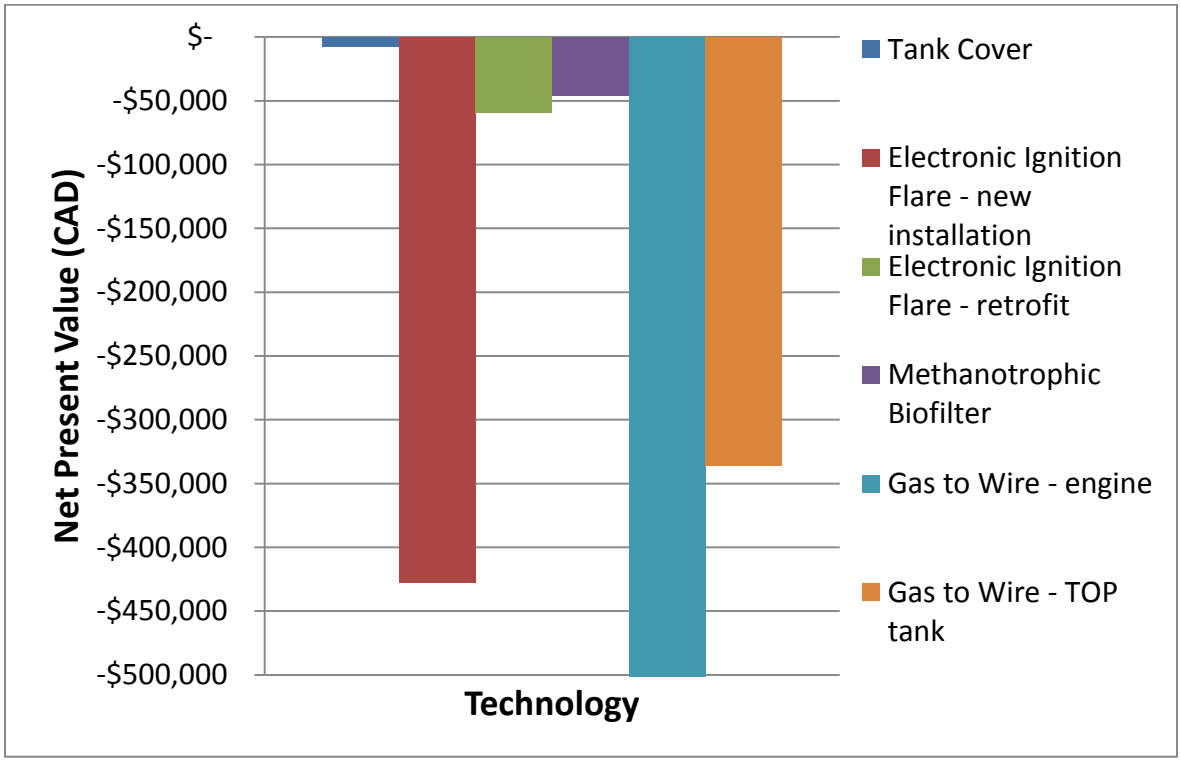

Figure 2: Results of Cash Flow Analysis on Shortlisted Technologies

Future Communication / Extension Activities

Given the information compiled in this report, SRC recommends:

- Continue with Phase 2 of this project and validate the methane mitigation potential of tank covers and biofilters at a commercial demonstration scale. SRC is developing the Center for Demonstration of Emissions Reduction (C-DER) to facilitate this testing.
- Review best practices in the oil and gas industry for reducing flaring and venting of methane, in other jurisdictions and world-wide.

Actual Project Costs:	**$25,000**

Funders: List of funders

AUPRF	$25,000
Other Leveraged Funding (cash)	$
Other Leveraged Funding (in-kind)	$