EMISSIONS REDUCTION ALBERTA

BACKGROUNDER

1800, 10020 101A Avenue
Edmonton, Alberta
T5J 3G2
Phone: 780-417-1920
Email: info@eralberta.ca
www.ERAlberta.ca

ERA METHANE CHALLENGE

TECHNOLOGIES THAT TARGET METHANE EMISSIONS IN ALBERTA'S OIL AND GAS INDUSTRY

1. Reducing Methane and Other Environmental Impacts from Oil Sands Tailings and Ponds

Titanium Corporation
Total project value: $10,200,000
ERA commitment: $5,000,000

- Titanium is working with Canadian Natural Resources Limited (Canadian Natural) to conduct engineering design for an oil sands tailings treatment system that eliminates certain tailings streams while recovering bitumen, solvent, and high-value minerals. By preventing solvent and bitumen release, the vast majority of methane emissions from mined oil sands operations can be reduced.
- This technology is targeted at froth treatment tails, which are estimated to be responsible for more than 90% of methane emissions from tailings ponds. Results from the Canadian Natural-sponsored project will be applicable to other large oil sands mines and results will be shared and disseminated through Canada's Oil Sands Innovation Alliance (COSIA).

Media contact:
Jennifer Kaufield CPA, CA
CFO and VP Finance, Titanium Corporation Inc.
JKaufield@titaniumcorporation.com
Phone 403-874-9498

2. Remote Generator Compressor Systems

Gentherm Global Power Technologies
Total project value: $3,570,000
ERA commitment: $1,785,000

- Gentherm Global Power Technologies is developing a Remote Generator Compressor System (RGCS) to help oil and gas operators quickly eliminate
- Methane emissions from pneumatic devices while facilitating the long-term transition from pneumatic controls to digital controls.
- The RGCS is a self-contained, skid-mounted system that efficiently converts natural gas into electricity and compressed air. Gas facility operators can deploy the RGCS and use the compressed air to convert their existing pneumatic devices from methane to compressed air.

Media contact:
James Rempel
Director Product Line Management, Gentherm Global Power Technologies
James.rempel@gentherm.com
403-910-5990

3. In-Pipe Turbine Generator Field Demonstration Project

ZKO Oilfield Industries Inc.
Total project value: $5,890,000
ERA commitment: $2,844,000

- ZKO has partnered with Peyto Exploration & Development to demonstrate an in-pipe turbine generator that uses flowing natural gas in the pipeline from the wellhead to generate electricity, which is used to power chemical injection pumps, eliminating a large source of methane venting in natural gas production.
- Chemical injection pumps currently operate pneumatically and vent methane to the atmosphere. The ZKO in-pipe turbine generates power from wellhead pressure with zero emissions and will be used to power electronic pumps to eliminate this methane venting.

Media contact:
Zane Novak
President, ZKO Oilfield Industries Inc.
znovak@zkoindustries.com
780-237-5558

4. Power Generating Combustor to Eliminate Methane Emissions

Alphabet Energy
Total project value: $4,300,000
ERA commitment: $2,150,000

- Alphabet has partnered with Alberta-based CDN Controls and Airworks Compressors to develop and demonstrate an innovative electricity generator for off-grid oil and gas sites to power pneumatic instrumentation, eliminating a major source of methane venting.
- Methane emissions from pneumatic devices at oil and gas sites will be eliminated by using electricity to power instrumentation instead of compressed natural gas as per current practice.

Media contact:
Mothusi Pahl
Senior Vice President, Alphabet Energy Inc.
mothusi@alphabetenergy.com
office: 1-832-404-2769
mobile: 1-415-746-0368

5. Targeted PureJet Incinerators for Methane Challenges

Petroleum Technology Alliance of Canada (PTAC)
Total project value: $1,544,000
ERA commitment: $772,000

- PTAC has partnered with Alberta-based Atlantis labs as well as Cenovus Energy and Husky Energy to develop and demonstrate a small-scale, enclosed incinerator at industry sites in the province where flaring is currently unavailable or uneconomic, targeted at eliminating methane that would otherwise be vented.
- The portability of the patented PureJet Incinerator device, coupled with its ability to handle a wide range of pressures and flow rates, will enable methane to be destroyed at sites where flaring is currently unviable or uneconomic.

Media contact:
Kristie Martin
Junior Project Engineer, PTAC Petroleum Technology Alliance Canada
kmartin@ptac.org
403-218-7711

TECHNOLOGIES THAT ADDRESS METHANE DETECTION, MONITORING, QUANTIFICATION

6. Demonstration of Aerial Methane Imaging for Wide- Area Methane Detection

Kairos Aerospace
Total project value: $537,000
ERA commitment: $263,000

- Kairos Aerospace has developed a technology to rapidly and cost-effectively locate and quantify methane releases over large areas. Early and accurate detection will enable directed repair of major methane leaks from a variety of sources.
- The project will demonstrate and validate its aerial methane imaging and quantification platform in Alberta.

Media contact:
Laura Yao
Head of Strategy, Kairos Aerospace
laura@kairosaerospace.com
650-386-5785

7. Satellite-Aircraft Hybrid Detection and Quantification of Methane Emissions

GHGSat
Total project value: $9,121,000
ERA commitment: $3,745,000

- GHGSat has partnered with COSIA, Schlumberger, Encana, GreenPath, and others in Alberta to develop and demonstrate a Calgary-based Aircraft-Satellite hybrid methane detection and quantification system.
- The two-tiered satellite/aircraft approach will enable screening and detection of large leaks from diffuse or point sources from orbit, followed by more detailed imaging and quantification by aircraft surveys that can enable directed repair of methane leaks.

Media contact:
Stephane Germain
President & CEO, GHGSat Inc.
stephane.germain@ghgsat.com
T: 514-847-9474 x205
C: 514-573-9127

8. Area Measurements of Methane & Carbon Dioxide

Canadian Natural Resources Limited (Canadian Natural)
Total project value: $11,530,000
ERA commitment: $5,000,000

- Canadian Natural has partnered with Alberta Based LuxMux, Boreal Laser, RWDI Air, the Southern Alberta Institute of Technology (SAIT), the University of Alberta, and others to conduct a comprehensive program to improve detection, monitoring and quantification of methane emissions from area sources such as mine faces and tailings ponds.
- By developing a holistic system of sensors and models, Canadian Natural plans to achieve significantly more accurate quantification of diffuse methane emissions which will enable more targeted reduction strategies.

Media contact:
Julie Woo, Public Affairs Lead
Julie.Woo@cnrl.com
403-514-7683

9. Imaging & Quantification System for Fixed Site Monitoring

ATCO
Total project value: $2,467,000
ERA commitment: $1,230,000

- ATCO has partnered with MultiSensor Scientific and Alberta-based Envent Engineering to develop a portable methane imaging and detection system that can be deployed temporarily or permanently at industry sites to continuously scan for methane leaks and quantify those that do occur.
- Faster detection and accurate locating of leaks will enable more rapid and directed remediation of methane emissions. ATCO expects to adopt the technology for use at its sites and make it available as a service.

Media contact:
Jennifer Sheehan
Senior Advisor, Communications, ATCO, Gas Distribution
Jennifer.Sheehan@ATCO.com
780-420-3908 (cell: 780-686-1078)

10. Proof-of-Concept Testing: Software to Quantify Emission Rates in Real-Time

Minnich and Scotto
Total project value: $621,000
ERA commitment: $300,000

- Minnich and Scotto has partnered with Alberta-based Boreal Laser to develop a methane quantification package that will enable existing laser-based sensors to be used in conjunction with AERMOD, the US Environmental Protection Agency (EPA)'s Guideline air quality dispersion model, to convert methane concentrations to real-time calculation of leak rates.
- The algorithm will enhance the capability of existing sensors and enable the modeling tool to be used for methane quantification. These advancements will enable better quantification of methane emissions from sites such as feedlots, mines, and landfills that are well-suited for open-path laser sensors.

Media contact:
Tim Minnich
Principal, Minnich and Scotto
trminnich@msiair.net
732-409-9900

PROJECTS THAT ADDRESS METHANE EMISSIONS FROM BIOLOGICAL SOURCES

11. Demonstration of Reduced Enteric Methane Emissions in Growing/Finishing Beef Cattle

Viresco Solutions
Total project value: $2,920,000
ERA commitment: $1,460,000

- Viresco, DSM and a consortium of Alberta agricultural partners have worked together to demonstrate a feed ingredient for cattle that significantly reduces cattle-based methane emissions.
- The ingredient can be introduced to regular feeding regimes to reduce the methane produced by each animal, enabling substantial reductions in emissions from Alberta's beef and dairy industries.

Media contact:
Karen Haugen-Kozyra, PAg
President, Viresco Solutions
karen@virescosolutions.com
780-270-0525

12. Genesee Wood Waste Biomass Co-Firing Project

Capital Power
Total project value: $30,345,000
ERA commitment: $5,000,000

- Capital Power, with the support of West Fraser, is working to develop a project that would utilize sawmill wood waste as a renewable energy source for the Genesee 2 power facility. Each tonne of wood waste used at Genesee would replace an equal volume of coal.
- The wood waste would otherwise be stockpiled and produce methane via decomposition. The project will reduce methane emissions from decomposition, and enable substantial greenhouse gas (GHG) reductions via displacement of coal.
- This initial funding by the ERA is an important first step toward the development of this project.

Media contact:
Michael Sheehan
Media Relations & Communications Manager, Capital Power
msheehan@capitalpower.com
780-392-5222