



PTAC

PETROLEUM
TECHNOLOGY
ALLIANCE
CANADA

2022-2023 ANNUAL REPORT



Managing & Facilitating
Collaborative Innovation

03 ABOUT PTAC

04 MESSAGE FROM THE BOARD

06 FY22 - FY23 IMPACT

07 PTAC ADVANTAGE

08 NETWORKS

11 COMMITTEES

21 PROJECTS LAUNCHED

22 ONGOING PROJECTS

23 PROJECTS COMPLETED

24 2022-23 EVENTS

25 MEMBERS

28 AWARD RECIPIENTS

30 AUDITOR'S REPORT

31 STATEMENT OF FINANCIAL POSITION



PTAC

ABOUT PTAC

OUR VISION

To help Canada become a global hydrocarbon energy technology leader.

OUR MISSION

Petroleum Technology Alliance Canada (PTAC) is a neutral, not-for-profit association dedicated to managing and facilitating innovation, cooperative research, technology advancement, demonstration, and implementation for a responsible Canadian hydrocarbon energy industry.



**REDUCE
EMISSIONS**



**PROMOTE
ECONOMIC GROWTH**



**IMPROVE FINANCIAL &
ENVIRONMENTAL
PERFORMANCE**

OUR PURPOSE

Manage and facilitate collaborative research and technology advancements for the collective benefit of all participants in the Canadian hydrocarbon energy industry by:

1. Enhancing awareness of cutting-edge technological solutions that effectively address industry challenges.
2. Cultivate an innovation ecosystem that brings together stakeholders to identify challenges, explore opportunities, and collaboratively initiate projects to tackle them.
3. Encourage active industry involvement in research, technology development, lab and field testing, demonstration, commercialization, and deployment by assisting in securing funding from diverse sources.
4. Facilitate the adoption of commercial technologies from industrial sectors and jurisdictions to the hydrocarbon energy industry.
5. Advocate for the implementation of innovative and sustainable practices for hydrocarbon systems.

FOCUS AREAS



**REDUCE
COSTS**



**MANAGING
ENVIRONMENTAL
IMPACTS**



**IMPROVING
OIL AND GAS
RECOVERY**



**IMPROVING
VALUE ADDED
PRODUCTS**



**TOWARDS A LOW
CARBON HYDROCARBON
ECONOMY**



MESSAGE FROM THE BOARD

The Canadian oil and gas industry is no stranger to the cyclical nature of our economic environment. While we have experienced periods teeming with prosperity and abundant growth, we have also been met with times wrought with formidable hardship, and adversity. Throughout its 27-year history, PTAC has weathered many storms alongside our industry partners, and has also celebrated the many victories we have been able to achieve collectively as a sector. This past year saw many of our stakeholders firmly breaking-free from the grips of the pandemic, finding themselves overcoming obstacles and attaining success that several years ago, appeared out of reach. While the pandemic presented the energy sector with arduous challenges on an unprecedented level, there is one learning that we can all agree upon – the Canadian oil and gas industry is stronger together than we are apart.

PTAC has always stood by its principles of collaborative innovation, and in the post-pandemic period, we pushed our mission to new heights, driving our activities forward and breaking boundaries not yet witnessed in our 27-year history. 2022-2023 brought PTAC its most successful financial year to date, generating our highest gross revenue ever at \$14.7 million, while exceeding nearly all of our corporate goals set forth the year prior. This success inevitably translates into the success of our member organizations, providing even more opportunities for material action, knowledge sharing, and technology innovation, to take place. This success was reflected in the results of the recent satisfaction survey reflecting 84% satisfaction. Part of our focus is maintaining the lowest management and facilitation fees possible at between 10% and 12%.

In addition to our slate of technology-focused activities, PTAC continued our longstanding role as the manager and facilitator of the Alberta Upstream Petroleum Research Fund (AUPRF). This past year AUPRF launched 19 new projects and managed 29 existing initiatives, all of which provide practical, science-based research to fill knowledge gaps related to the management of high priority environmental and social matters within Alberta's oil and gas industry, and assist in the development of smart policies, regulations, and best practices. AUPRF also made enhancements to its communications strategy this past year, streamlining its outreach to disseminate its research efforts and results more effectively and efficiently to relevant stakeholders.

Stakeholder outreach also took centre stage through PTAC's large roster of events that were held this past year, ranging from classroom-sized technology information sessions and webinars, to international multi-stream conferences. In November of 2022, PTAC hosted the sold-out Net Zero Conference and Expo, "The Future of Energy – Achieving Net Zero and Growing Canada's Economy" in Calgary. This event focused on five streams pertaining to net-zero by 2050 activities, including methane, CCUS, hydrogen, electrification, and nuclear energy. Several months later, in April 2023, PTAC had the pleasure of hosting the 2023 Methane Leadership Summit in Banff. This sold-out event provided a forum for collaborative dialogue amongst key experts in the methane space, and served as a platform where discussions on technology innovation and new practices aimed at helping the oil and gas industry achieve its reduction targets, could take place.

PTAC also hosted a variety of webinars throughout the past year, which aimed to directly inform producers of technologies and best practices available to mitigate costs and reduce emissions, and help bridge the gap between Canadian SMEs and their target audience. Part of PTAC's ongoing efforts to highlight emerging and available technology solutions amongst the oil and gas network included the addition of over 60 new videos to our technical library, providing convenient virtual access to a multitude of technology solutions and providers, with a simple click.

PTAC BOARD OF DIRECTORS

(As of March 31, 2023)

Kevin Stashin, Chairperson
Independent

Cheryl Trudell, Chair-Elect
Joint Interest Production Manager, Imperial

Joy Romero, Vice Chair
*Executive Advisor, Innovation,
Canadian Natural Resources Limited*

Andrew Noseworthy
*Assistant Deputy Minister, Clean
Technology (ISED) and Special Advisor to
the President, Energy & Strategic Initiatives
(ACOA)*

Brian Doucette
Director, Environmental Excellence, Suncor

Ken Putt
Independent

Martin Foy
Director, Chief Operations Officer, AER

Matt Bryan
Managing Director, SLB

Michele Evans
Assistant Deputy Minister, PrairiesCan

Mike Ekelund
Independent

Murray Todd
Independent

Nicole Harbauer
Trade Commissioner, Global Affairs Canada

John Zhou
*Chief Cleantech Officer & VP Clean
Resources, Alberta Innovates*

Randy Rudolph, F&A Committee Chair
Director, Senior Air Quality Scientist, AECOM

Richard Slocomb
*VP, Well and Energy Resource Stewardship,
BC Energy Regulator*

Soheil Asgarpour
President & CEO, PTAC

This past year also saw PTAC take its collaborative efforts beyond our borders, launching international initiatives and working alongside our global oil and gas partners. Part of our newest strategic direction has PTAC expanding our international activities, largely by helping Canadian SMEs penetrate international markets and increase their technology uptake through new customer bases. PTAC launched its first trade mission in March 2023, partnering with 13 export-oriented SME members and travelling to Houston, Texas for CERAWEEK. This allowed our SME partners to showcase their innovative technology solutions on a global platform, establishing new strategic partnerships past our geographical borders. New partnerships were also forged across the pond with our UK industry partners, through the Net Zero Technology Centre (NZTC) based in Scotland. This exciting collaborative initiative aims to explore new solutions in closing inactive wells, and reducing methane emissions from leaky wells both within Canada and abroad.

The expansion of our activities on the international stage throughout 2022-2023 also led to the launch of new virtual events, providing an opportunity for widespread knowledge sharing amongst industry experts operating around the world. Webinars and virtual meeting rooms allowed us to connect with our international oil and gas counterparts, specifically those operating within the US, Australia, Pakistan, Indonesia, and South America. These events provided participants with a unique opportunity to engage in the exchange of ideas and insights on energy innovation and emerging technologies on a broad scale, while progressing towards the transition to a clean energy future.

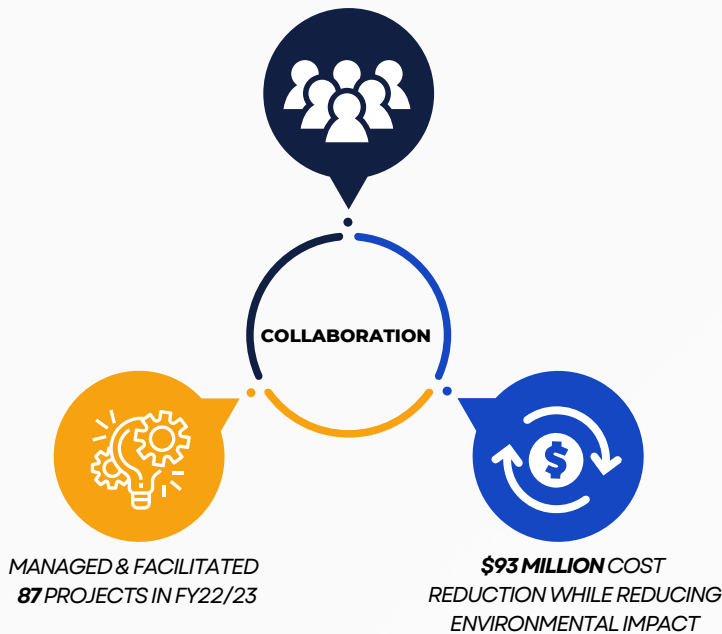
As we shift our focus to the year ahead, many of the themes focused on this past year will have an elevated level of priority as we take another step closer to achieving emissions reductions targets at home, and on a global scale. Activities focused on achieving net-zero by 2050 will ramp up in the coming year, with increased focus on best management practices, new technology solutions, and a net-zero conference, slated for the upcoming calendar. PTAC will also continue to expand its activities within the digital realm, tight oil operations, and methane reductions.

Part of this expansion includes continued work on the AUPRF program, as well as amplified SME support initiatives through ongoing market fit analyses. As always, activities to support producers most pressing needs will remain a key focus of PTAC's continued work, prioritizing the uptake of technologies to reduce methane emissions, and cut costs.

While we reflect on our accomplishments over the last fiscal year, PTAC recognizes that our continued success is only made possible with you, our outstanding members and active volunteers. You are the key players responsible for helping cultivate a collaborative innovation ecosystem that continues to push boundaries and drive change within the Canadian energy industry. We look forward to another exciting and progressive year ahead!

PTAC IMPACT

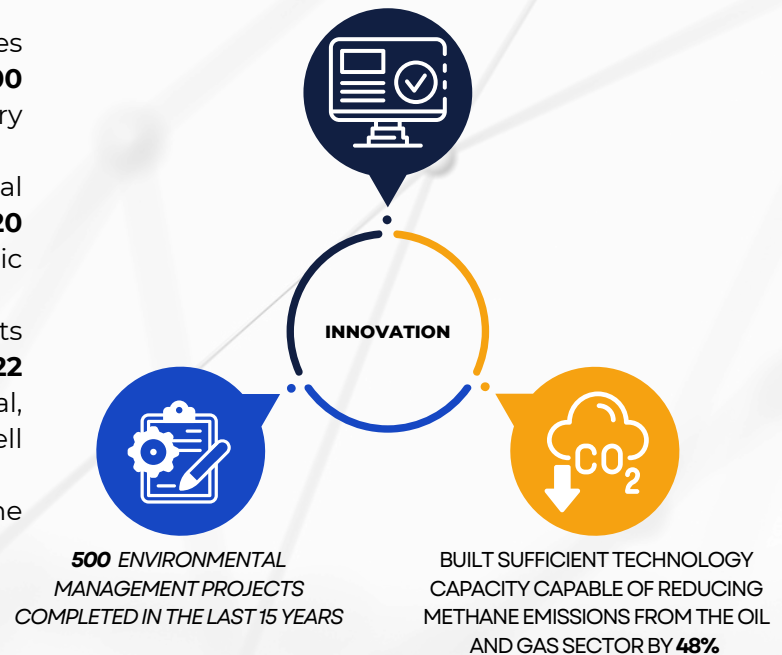
12 PTAC STAFF



- One technology amongst tens of technologies reduces GHG emissions equal to taking **175,000 cars** off the road annually while reducing industry costs by **\$20 million** annually.
- Completed **55** assessments with financial assistance from NRC-IRAP and launched **20** consortia to help SMEs achieve economic prosperity.
- AUPRF's **48** Multi-Disciplinary Research Projects (19 launched, **7** completed, and an additional **22** ongoing) addressing Air, Ecological, Remediation/Reclamation, Water, and Well Closure.
- Supporting the capacity to reduce methane emissions by **90%** from the 2012 level by 2030.

- Supported Canada to reduce its oil and gas emissions by over **40%** of the 2012 level.
- Target to increase the technology capacity for reducing methane emissions from **48%** to **75%** within the next four years.
- Completed over **500** applied research environmental management projects, with **89** developed, field-tested, demonstrated, and deployed for methane detection and mitigation.
- Systematic Third-Party Validation of Environmental and Economic Performance of Methane Reduction Technologies and Methane Consortia Program consortia provide up to **75%** cost coverage for equipment and installation to encourage adoption.

**800+ PROJECTS
COMPLETED IN THE LAST 27 YEARS,
DELIVERING RESULTS WITH THE LOWEST
MANAGEMENT FEE.**





PTAC ADVANTAGE

MEMBERSHIP ADVANTAGE

As a member of PTAC, you have the opportunity to work closely with industry stakeholders to tackle current and future challenges through research and development projects. The collaborative model that PTAC has implemented is very effective in delivering cost-effective facilitation and project management, while ensuring everyone involved has an equal chance to contribute and benefit from the outcomes. Joining PTAC is a great way to make a positive impact and help drive progress in your industry.

COLLABORATION ADVANTAGE

When producers, research providers, governments, academics, transporters, and service and supply companies come together, they can combine their unique skills and perspectives to leverage their respective expertise, influence, and capacity. This collaborative approach promotes a holistic view of projects, incorporating perspectives from throughout the value chain. This can spark fresh ideas and cross-discipline conversations that lead to efficiencies and innovation. By mobilizing funding from all stakeholders, large research and development projects can be pursued that would be too costly for any single organization to undertake. This approach helps to mitigate risks, set sights higher, and share success.



PTAC STAFF

Soheil Asgarpour

Ph.D., FCAE, FCIM, FCSSE, P.Eng.
President & CEO
403-218-7701
sasgarpour@ptac.org

Allan Fogwill

Chief Operating Officer
403-218-7709
afogwil@ptac.org

Braden Kimoff

Communications Specialist
403-218-7702
bkimoff@ptac.org

Brian E. Spiegelmann

P.Eng.
Senior Technical Advisor
403-218-7704
bspiegelmann@ptac.org

Christine Hoepfner

Project Coordinator
403-218-7712
choepfner@ptac.org

Julia Weissenberger

Technical Library Curator
jweissenberger@ptac.org

Katie Cheyne

Operations Support
kcheyne@ptac.org

Lorie Mayes

Environmental Research Coordinator
403-218-7707
lmayes@ptac.org

Marc Godin

MBA, P.Eng.
Director, Technology
403-218-7720
mgodin@ptac.org

Shay Sharma

Project EIT
ssharma@ptac.org

Tannis Such

Director, Environmental Research
403-218-7703
tsuch@ptac.org

Yusra Muzaffar

CPA, CGA, ACCA (UK)
Accountant
403-218-7708
ymuzaffar@ptac.org

ALBERTA UPSTREAM PETROLEUM RESEARCH FUND (AUPRF)

AUPRF finances environmental research aimed at tackling significant challenges in air quality, ecosystems, land reclamation, water resources, and the closure of wells associated with conventional oil and natural gas operations. The AUPRF program is entirely funded on a voluntary basis by Alberta's oil and natural gas operators, while PTAC serves as an impartial third-party manager. Under the AUPRF program, industry collaborates with policymakers and regulators to identify and prioritize research requirements with the support of the Canadian Association of Petroleum Producers (CAPP) and the Explorers and Producers Association of Canada (EPAC).

AUPRF provides practical science-based studies to address knowledge gaps of high priority environmental and social matters related to oil and gas operations in Alberta, and assists in the development of smart policies, regulations and best practices for the sustainable development of Alberta's world class hydrocarbon resources. AUPRF is operated by an oversight committee and five technical committees covering each of the focus areas. Together they oversee one-year and multi-year projects to develop technology solutions and business processes. This continuing collaboration mechanism sustains a network of innovators and funders contributing to reducing the sector's environmental footprint. The success of the program is demonstrated through the more than 500+ projects from over \$36 million investment from industry leveraging a total of \$190 million in research dollars and delivering over \$125 million in annual operating savings for oil and gas companies.

Projects must bring value to Producers in Alberta but can provide value to Producers in other regions. Also, projects can occur outside of Alberta. There is a unique AUPRF's Annual Report which forms the report to our oil and gas company funders which can be found at: www.auprf.ptac.org

CANADIAN EMISSIONS REDUCTION INNOVATION CONSORTIUM (CanERIC)

CanERIC is an international network of emissions reduction test facilities with a vision to meet the global emissions reduction challenge by providing practical, streamlined support for validation, bench testing, and field testing of innovative technologies. During 2022-2023, CanERIC launched 16 new projects and completed five carryover projects. For the 3 years CanERIC has been in existence (2021-2023), 31 projects have been completed. In addition to supporting technology development, CanERIC also supports developing students in higher education and technicians early in their careers as a critical aspect of technology transfer.

CanERIC is a consortium consisting of 12 industry members and 12 universities and technical research centres in Canada and the United States who have dedicated more than a billion dollars' worth of field and lab facilities. By securing funds from Alberta Innovates and NRCan, and with industry support, PTAC has been able to help small and medium enterprises (SME) field test their technologies at no cost to them. In 2022-23, three technologies have been assessed in the lab, nine technologies have been developed and/ or field tested, and six technologies are undergoing additional evaluation. This three-year program was designed to systematically address and reduce risks associated with methane emissions detection and reduction technologies.

Guided by the Industry Solutions Steering Committee (ISSC), composed of upstream producers and midstream companies, and the Infrastructure Steering Committee (ISC), composed of post-secondary learning institutions and government research centers, CanERIC's work focused on the advancement of reduction technologies. The outcome of the CanERIC portfolio of technology projects is estimated to reduce methane emissions by 1.0 million tonnes of CO₂e per year in 2026, increasing to 3.5 million tonnes of CO₂e per year in 2030.





DIGITAL INNOVATION NETWORK (DIN)

In collaboration with the Clean Resource Innovation Network (CRIN), DIN focuses on digital transformation for the benefit of Canadian producers, researchers, academia, government organizations, regulatory bodies, and entrepreneurs. DIN contributes to the direct creation of thousands of jobs. The purpose is to facilitate and energize the commercial deployment of digital technologies. Four networking events were facilitated this year: "Canadian UAVs Webinar", "Digital Spotlight: Actionable Outcomes from Artificial Intelligence and Machine Learning", "How Robotic Process Automation (RPA) Creates Step-Change Improvements in Efficiency, Cost Reduction, Safety, and Environmental Operations in Oil & Gas (SAIT)", "Everything you wanted to ask about how drone surveillance can affect your asset and sustainability initiatives – but didn't know to ask! (AirMarket)".

METHANE EMISSIONS REDUCTION NETWORK (MERN)

MERN champions projects and initiatives to detect, quantify and reduce methane emissions, as well as identifying and addressing technology gaps. Our goal is, through ongoing and planned technology initiatives, under the MERN umbrella, to increase the collective technology capacity and help the oil and gas industry meet its methane emissions targets.

In 2022-23, the Network, in collaboration with CRIN, organized and participated in forums, workshops, and Technology Information Sessions to share the latest developments in methane reduction technology, as well as raise awareness and increase uptake of innovative, cost-effective oil and gas practices.





NRC-IRAP SME PROGRAM

The National Research Council of Canada Industrial Research Assistance Program (NRC-IRAP), has been working on the Small and Medium Sized Enterprise (SME) innovation program for over a decade. This initiative is designed to assist SMEs in navigating the constantly evolving energy marketplace. NRC-IRAP has a wealth of experience providing technical and business advisory services for R&D, as well as strategic intelligence and tailored solutions to meet specific business needs. Additionally, NRC-IRAP offers financial support to eligible SMEs in Canada to help them innovate with technology. Businesses that work with NRC-IRAP are better positioned to engage in applied R&D, introduce new products and services to global markets, and access new markets.

In 2022-23, PTAC helped to complete 24 Product Market Fit (262 completed since 2016) and 18 Project Consortium Development engagements (145 completed since 2016). The 10 projects launched in 2022-23 with PTAC support and involving IRAP clients had a total value of \$5.6 million. Since 2014, the program has supported the launch of 65 projects with a total value of \$79.4 million. The associated cumulative emissions reductions in Canada from PTAC and IRAP facilitated projects are forecasted to be 60 million tonnes CO₂e in 2030 and 360 million tonnes CO₂e in 2050.

TECHNOLOGY FOR EMISSIONS REDUCTION AND ECO-EFFICIENCY (TEREE)

The Technology for Emissions Reductions and Eco-Efficiency (TEREE) Network is a collaborative initiative that has brought together stakeholders from various sectors to work towards reducing air emissions in the oil and gas industry. This effort is commendable and has resulted in the transfer of technologies used globally in the sector, making a significant contribution to the industry. TERE projects have made a substantial contribution to the industry through the transfer of technologies used globally in the sector.



COMMITTEES

OUR VARIOUS COMMITTEES ARE AT THE HEART OF OUR RESEARCH AND DEVELOPMENT SUCCESS. ACROSS OUR NETWORKS AND PROJECTS, THEY GUIDE OUR WORK.

AIR RESEARCH PLANNING COMMITTEE (ARPC)¹

The Air Research Planning Committee (ARPC) is a technical committee that supports the Alberta Upstream Petroleum Research Fund (AUPRF) Program. The goal of ARPC is to help the industry expand its credible and relevant information to address knowledge gaps on high-priority methane and other emissions. They aim to initiate dependable research projects, both fundamental and applied, on existing and emerging environmental issues to support the development of new technologies and industry best practices. By doing so, ARPC supports the industry's desire for shared research development and provides an opportunity to understand and manage these matters in a safe and effective manner.

Andrea Zabloski

Andrew Cattran

Carolyn Ussher

Colin Hennel

Don McCrimmon

Filiz Onder

Gerald Palanca

Graham Noble

Jacob Bayda

James Beck

Koray Onder

Moruf Aminu

Neuczki Mathurin

Peter Kos

Randy Dobko

Sean Hiebert

Sean Smith

Yaomin Jin

Canadian Natural Resources Limited

NuVista Energy

Alberta Energy Regulator

Bonavista Energy

Canadian Association of Petroleum Producers

Ovintiv

Alberta Energy Regulator

Saskatchewan Ministry of Energy and Resources

Saskatchewan Ministry of Energy and Resources

Suncor

TC Energy

Encana

TC Energy

BC Ministry of Environment and Climate Change Strategy

Alberta Environment and Protected Areas

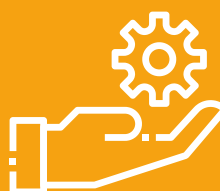
Cenovus Energy

Environment and Climate Change Canada

BC Ministry of Energy, Mines and Low Carbon Innovation



250+
VOLUNTEERS



15
TECHNICAL
STEERING
COMMITTEES

AUPRF OVERSIGHT COMMITTEE (AOC)¹

The AUPRF Fund supports practical science-based studies that develop credible and relevant information to address knowledge gaps in the understanding and management of high priority environmental and social matters related to oil and gas exploration and development in Alberta. Research reports are shared with the oil and gas industry funders as well as regulators and government agencies that serve on the technical committees. The program is governed by an Oversight Committee comprised of four CAPP members and two EPAC members. These are the voting members of the committee. Observers on the committee include representatives from the Alberta Energy Regulator and Alberta Environment and Protected Areas.

Scott Volk (Chair)
James Agate (Vice Chair)
Alexandra Robertson
Jason Brunet
Kellen Foreman
Mike Fulsom
Scott Milligan
Susan McGillivray
Tara Payment
Tony Jackson

Tourmaline Oil Corp
Canadian Natural Resources Limited
Alberta Energy Regulator
Alberta Energy Regulator
Ovintiv
Explorers and Producers Association of Canada
Alberta Environment and Protected Areas
Alberta Environment and Protected Areas
Canadian Association of Petroleum Producers
Cenovus Energy

ECOLOGICAL RESEARCH PLANNING COMMITTEE (ERPC)¹

As we continue to explore solutions for resource access issues, the Ecological Research Planning Committee (ERPC) is dedicated to supporting the Alberta Upstream Petroleum Research Fund (AUPRF) Program. ERPC is committed to developing credible and relevant information to address knowledge gaps related to high-priority environmental challenges, such as woodland caribou, habitat relationship for listed species, and the health and size of species at risk. By supporting the industry's desire for shared research development, ERPC is paving the way for a safe and effective approach to understanding and managing these matters.

Agnes Wajda-Plytta
Ben Hale
Carol Engstrom
Devon Versnick-Brown
Jennifer Shalagan
Jeremy Reid
Krista Phillips
Mark Boulton
Shane Patterson
Sherry Becker
Tara Bernat

Alberta Energy Regulator
Cenovus Energy
Independent
Canadian Natural Resources
Cenovus Energy
Canadian Natural Resources
Canadian Association of Petroleum Producers (CAPP)
Suncor
Alberta Environment and Protected Areas
Imperial Oil
Ovintiv



ENERGY UTM STEERING COMMITTEE

Energy UTM is a technology to allow safe and regulated drone flights beyond visual line of sight (BVLOS). Drones are a very advantageous technology with countless applications. However, in Canada, as in most countries, regulations are not yet in place for full deployment. Robust and reliable technologies are required to permit, approve, monitor, and regulate drone flights to ensure public safety and the safety of crewed aircrafts. AirMarket and PTAC member oil and gas companies are collaborating for the piloting of the UTM technology in the context of national trials supervised by Transport Canada and NAV Canada.

The Project, which was completed in 2023, has demonstrated Cellular UTM services using the existing TELUS fixed telecommunications infrastructure to conduct trials between Edmonton and Fort McMurray and in the oil sands region.

The outcome will be reduced environmental impact (reduced GHG emissions and land disturbance), substantial operating cost reductions, improved worker safety, and the progression of a technology and service that could be deployed in other industries and other regions, and open the door to automation, machine learning and artificial intelligence application in resource industries.

Bruce Duong
Denis Niles
Genevieve Dacambra
Jeremy Byatt
Lindsay Mohr
Stan Tumoth
Tania Rizwan
Tedman Jess

Alberta Innovates
Telus
Suncor
AIRMarket
AIRMarket
TC Energy
TC Energy
Suncor

ELECTRIC DUMP VALVE ACTUATOR STEERING COMMITTEE (EDVA)

Used to provide process control for flow rate, pressure, and temperature, pneumatic devices contribute to methane emissions in the Canadian oil and gas sector. The objective of this project was to complete, based on an initial proof of concept, the prototype design and testing of a zero-emission, fail-safe, and affordable electric dump valve actuator (EDVA). It involved the design, fabrication, shop tests, and field tests of a zero-emission, affordable, and fail-safe electric dump valve actuator to replace existing pneumatic valves.

The Fail-Safe EDVA will enable the replacement of existing pneumatic valve actuators, which cause a large percentage of methane emissions in production sites across Canada (i.e., British Columbia, Alberta, Saskatchewan, and Manitoba). Completing the project offers the opportunity for significant greenhouse gas emissions reductions estimated to be at 3.3 million tonnes of CO₂e after year 5 of deployment in the Canadian oil and gas sector, contributing to Canadian targets for emissions reductions and the Net Zero vision. This project was completed in 2023.

Brad Morello
Brian Van Vliet
Charles Whitehead
Jim Wilson
Owen Henshaw
Patrick Kitchin
Ray Lambert
Ronda Foster
Sean Hiebert
Wes Barret

Shell
Spartan Controls
Linear Motion Technologies
Linear Motion Technologies
Cenovus Energy
Whitecap Resources
Cenovus Energy
Linear Motion Technologies
Cenovus Energy
Linear Motion Technologies

INTELLIGENT METHANE MONITORING AND MITIGATION SYSTEM (IM3S) STEERING COMMITTEE

The centerpiece of IM3S is a new modelling system to develop and evaluate the cost and mitigation potential of different combinations of technologies and methods in Alternative Fugitive Emissions Management Programs (Alt-FEMP). The modelling approach links site context, leak characteristics, and performance metrics to build cost-effective leak detection programs, and allows those programs to adjust over time, based on the backpropagation of field data. The outcome is a tool for regulators and industry to develop, optimize, track, and adapt Alt-FEMPs. IM3S integrated modelling, controlled testing, and field trials, and included four main elements: (1) Model development to inform controlled release testing protocols, (2) Controlled release testing to provide input data for modelling to characterize technology and method performance, (3) Model simulations to estimate the ratio of cost to emissions mitigation potential and to adapt programs based on the backpropagation of data from field deployment, and (4) Field trials to verify operational performance and to refine model parameterizations.

The Project developed new knowledge and tools to design, simulate, and evaluate the performance of Alt-FEMPs. The main technical work focused on improvements to the Leak Detection and Repair Simulator (LDAR-Sim), an open-source modelling system for simulating Alt-FEMPs, and increased accessibility so users can run simulations online via standard web browsers. Full deployment of the Project technology is expected to result in a reduction of 19 million tonnes per year of GHG emissions. This project was completed in 2023.

Chris Hugenholtz
Claude Ghazar
Jessica Shumlich
Richelle Foster
Thomas Fox

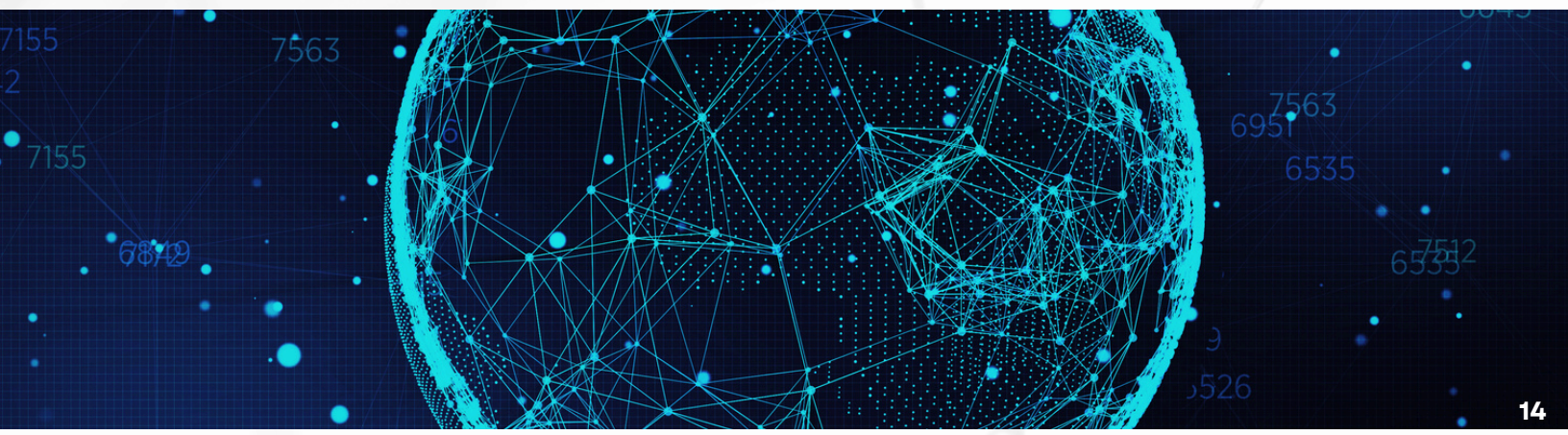
University of Calgary
Alberta Innovates
Highwood Environmental Management
Canadian Natural
Highwood Environmental Management

INDUSTRY SOLUTIONS STEERING COMMITTEE (ISSC)²

The priorities set by the CanERIC ISSC, which represents producers and mid-streamers, are crucial for the development of relevant technologies for detecting and reducing methane emissions. The committee facilitated the portfolio of CanERIC technology demonstration projects.

Andrea Zabloski
Brandon Fong
Brian Doucette
Eldon Siegle
John Yakielashek
Michael Leung
Kendell Esau
Morgan Wrishko
Neuczki Mathurin
Patrick Kitchen
Rob MacNutt
Tyler Homan

Canadian Natural Resources Limited
TC Energy
Suncor
Ovintiv
TCE
ATCO
Bonavista
Cenovus Energy
TC Energy
Whitecap
NuVista
Teine





INFRASTRUCTURE STEERING COMMITTEE (ISC)²

When it comes to developing technologies that can help reduce methane emissions, it's essential to have the right priorities in place. The Infrastructure Steering Committee (ISC) is made up of academics who are responsible for testing and evaluating these technologies. The ISC facilitated CanERIC's portfolio of infrastructure investments and HQP training projects.

Bob Davies
David Risk
Erica Emery
Erin Powell
Fred Wassmuth
Jason Olfert
Jim Brydie
Kirk Osadetz
Kyle Daun
Matt Johnson
Nader Mahinpey
Neil Yaremchuk
Scott Mundle
Vita Martez
Xiaomeng Wang

Southern Alberta Institute of Technology
St. Francis Xavier University
Saskatchewan Research Council
Saskatchewan Research Council
Innotech Calgary
University of Alberta, FlareNet
CanmetENERGY-Devon
Carbon Management Canada
University of Waterloo, FlareNet
Carleton University, FlareNet
University of Calgary
Innotech Vegreville
University of Windsor
Southern Alberta Institute of Technology
CanmetENERGY-Devon

METHANE CONSORTIA PROGRAM STEERING COMMITTEE (MCP)

In our constant endeavour to lower methane emissions through innovation, PTAC – along with Alberta Environment and Protected Areas – formed the Methane Consortia Program. This collaborative committee promotes the deployment of innovation within the Alberta oil and gas sector.

The Program will increase market uptake of commercial technologies to significantly reduce methane emissions and will demonstrate GHG reductions in the near term (6-12 months) by leveraging the deployment of methane projects in the PTAC inventory. The outcome will be building capacity for the sector to deliver additional GHG reductions in the medium term and developing new technologies for energy efficiency and methane emissions reductions that will create economic and employment opportunities in the medium term while opening the door to greater GHG reductions. Project participants consist of Alberta oil and gas producers and technology providers. In 2022-23, 13 subprojects were completed. Up to now MCP has completed 101 subprojects. The installations supported by the project reduce GHG emissions by 10,000 tonnes. The full anticipated adoption of the technologies will reduce GHG emissions by a cumulative 100 million tonnes by 2050.

Chris Hugenholtz
Gerald Palanca
Heather Carmichael
Monica Micak

University of Calgary
Alberta Energy Regulator
Environment and Protected Areas
Environment and Protected Areas

PUREJET STEERING COMMITTEE

When flaring is unviable or uneconomic, venting may occur. Targeted at eliminating this risk, PTAC is facilitating the PureJet project with collaborators Cenovus Energy, the City of Medicine Hat, Emissions Reduction Alberta, and Alberta-based Atlantis Research Labs to develop the PureJet Incinerator. This device, coupled with its ability to handle a wide range of pressures and flow rates, enables methane to be destroyed at sites.

The goal of the PureJet Demonstration Project is to work with clients who each have a slightly different application across the oil/gas supply chain. Working on this project with multiple oil/gas operators will also give Atlantis valuable industry experience which will assist in refining the ideal market roll-out strategy. Throughout these pilots, Atlantis' engineering team collected data and monitored performance, so that the PureJet incinerator design was validated and optimized.

Cumulative GHG emissions reductions are expected to be 140 million tonnes by 2050.

Aaron Baugh
Janelle Mravcak
Vladimir Mravcak

Emissions Reduction Alberta
Atlantis Research Labs
Atlantis Research Labs

SYSTEMATIC THIRD-PARTY VALIDATION OF ENVIRONMENTAL AND ECONOMIC PERFORMANCE OF METHANE REDUCTION TECHNOLOGIES (STV) STEERING COMMITTEE

STV is supported by a broad partnership of operators, government regulators and policymakers, and innovators with PTAC as a neutral third-party facilitator to generate complete field-based performance for a cohort of methane reduction technologies, thus providing operators with information to confidently purchase equipment at scale and benefiting stakeholders, governments, innovators with local market growth and a launchpad for exports.

STV removed a critical barrier (knowledge gap) to reducing methane emissions while returning the oil and gas sector to an economically strong engine that provides high-quality employment. To date, 26 subprojects have been installed and are continuing to operate, generating information and learnings for industry. Deployment at scale of the project technologies is expected to yield a GHG emissions reduction of 55 million tonnes per year.

Claude Ghazar
Morgan Wrishko
Patrick Kitchin
Richelle Foster

Alberta Innovates
Cenovus Energy
Whitecap Resources
Canadian Natural Resources Limited





REMEDATION RECLAMATION RESEARCH COMMITTEE (RRRC)¹

The RRRC is a crucial technical committee that supports the AUPRF Program. They work towards the development of credible and relevant information that addresses knowledge gaps related to soil contaminants and vegetation. Specifically, they focus on assessing and managing exploration and production sites as related to geo-environmental protection, soil and groundwater remediation and reclamation. Their work is essential for ensuring that these high-priority issues are managed in a cost-effective manner.

Christopher Boyd
Debbie Tainton
Devin Scheck
Elise Neumann
Jason Desilets
Jeff Mills
Jennifer Thompson
Jonas Fenn
Linda Eastcott
Lisa Warren
Lori Neufeld
Marci Jacula
Nadia Cruicshank
Paul Hartzheim
Rick Rohl
Sara Blacklaws
Shawn Glessing
Sheldon Exner
Sonia Glubish
Tom Knapik
Tyrel Hemsley

Shell
Canadian Natural Resources Limited
BC Energy Regulator
Alberta Environment and Protected Areas
Cenovus Energy
Orphan Well Association
Revitalize Energy
WhiteCap
Imperial Oil
Cenovus Energy
Imperial Oil
Revitalize Energy
Alberta Energy Regulator
Canadian Association of Petroleum Producers
ARC Resources
Alberta Energy Regulator
Cenovus Energy
Crescent Point Energy
Canadian Natural Resources Limited
Plains Midstream
Alberta Environment and Protected Areas

SUPPORT FOR SMALL AND MEDIUM SIZED ENTERPRISES (SMES) PROGRAM

Some of the industry's most ground-breaking innovations flow from the SME sector, yet these small companies often face significant barriers in bringing their ideas to market. PTAC facilitates the SME program in collaboration with representatives of the National Research Council Industrial Research Assistance Program (NRC-IRAP) who reach out to their colleagues across Canada. The Committee discusses practical opportunities to provide innovation support to SMEs, particularly for the demonstration and deployment of near-commercial or deployment-ready technologies that improve environmental performance and reduce costs.

Arvinder Kainth
Tamer Al-Ramahi

National Research Council Industrial Research Assistance Program
National Research Council Industrial Research Assistance Program

TECHNOLOGY FOR EMISSIONS REDUCTION AND ECO-EFFICIENCY

(TEREE)

The TERE Committee supports network activities and projects. It is composed of industry, services, products technology providers, and provincial and federal government representatives convened to oversee finding and implementing new technologies and methods required to achieve air emissions reductions

TEREE meetings occur four times per year to discuss relevant and current topics and are a unique opportunity for practitioners to share practical insights with their colleagues.

Andrew Cattran
Andrew McClausland
Andrew McDowell
Arvinder Kainth
Brenna Barlow
Brian Van Vliet
Brendan Moorehouse
Bruce Duong
Cam Dowler
Cam Rollins
Carolyn Pfau
Charles Ward
Chelsea O'Connor
Connor O'Shea
Cooper Robinson
Dallas Rosevear
Dan Li
Dani Urton
Derek Kelly
Derek L'Hirondelle
Don D'Souza
Doug Bezpalko
Gerald Palanca
Graham Noble
Greg Unrau
Hector Ortiz
James Holoboff
Joshua Anhalt
James Beck
Jessica Schumlich
Kelly Newnham
Kirk Osadetz
Kevin Heal
|Koray Onder
Kourosh Zanganeh
Krystina Edwards
Lisa Studzinski
Liz O'Connell
Logan Leduc

National Research Council Industrial Research Assistance Program

NuVista
BMO Radicle
LCO Technologies
BMO Radicle
Spartan Controls
Highwood Environmental Management
Alberta Innovates
Spartan Controls
Arolytics
Alberta Energy Regulator
Alberta Department of Energy
SFC Energy Canada
Westgen Technologies
BMO Radicle
Clear Rush
Crescent Point
Vertex
Natural Resources Canada
SFC Energy Canada
Government of British Columbia
Calscan
Alberta Energy Regulator
Government of Saskatchewan
Repsol
Spartan Controls
Process Ecology
GreenPath Energy
Suncor
Highwood Environmental Management
Advisian
CMC Research Institutes
BMO Radicle
TC Energy
Natural Resources Canada
Highwood Emissions Management
Enerplus
Arolytics
Environment Canada





Mark Jamieson
Mark Summers
Mike D'Antoni
Michael Lawson
Milos Krnjaja
Monica Sippola
Morgan Wrishko
Moruf Aminu
Neuczki Mathurin
Olivia Petrus
Owen Henshaw
Paul Jiapizian
Patrick Kitchin
Rao Ravi
Ray Lambert
Richelle Foster
Roy Hunt
Scott Smith
Sean Hiebert
Steve Froehler
Taryn Humpherys
Thomas Fox
Yonathan Dattner

Alberta Energy
Emissions Reduction Alberta
GreenPath Energy
Alberta Energy Regulator
Alberta Energy Regulator
Kuva systems
Cenovus Energy
Ovintiv
TC Energy
Spartan Controls
Cenovus Energy
Environment Canada
Whitecap Resources
Spartan Controls
Cenovus Energy
Canadian Natural
Advisian
Cenovus Energy
Cenovus Energy
LCO Technologies
Qube
Highwood Environmental Management
Luxmux Corporation

WATER INNOVATION PLANNING COMMITTEE (WIPC)¹

The Water Innovation Planning Committee (WIPC) is an important technical committee that supports the Alberta Upstream Petroleum Research Fund (AUPRF) Program. Their work is dedicated to providing credible and relevant information that addresses knowledge gaps related to water issues in upstream oil and natural gas development. They focus on identifying key challenges for the energy sector in managing water across the spectrum, including sourcing, storage, transport, treatment, recycling/reuse, and disposal. By working towards the development of shared research, WIPC ensures that high-priority environmental and social matters related to water are managed effectively and responsibly.

Geoff Webb
Jarred Anstett
Kristi Stucklschwaiger
Matt Mclean
Michael Bevan
Michelle Morris
Natasha Rowden
Neil Fricke
Paul Martin
Rodney Guest
Sarah Belak
Scott Hillier
Scott Rayner
Tara Payment

Canadian Natural Resources Limited
Murphy Oil
Encana
Cenovus Energy
Alberta Energy Regulator
Alberta Environment and Protected Areas
MEG Energy
Suncor
ConocoPhillips
Suncor
Tourmaline Oil
Cenovus Energy
MEG Energy
Canadian Association of Petroleum Producers

WELL CLOSURE RESEARCH COMMITTEE (WCRC) FORMERLY WELL ABANDONMENT RESEARCH INITIATIVE COMMITTEE (WARI)¹

The Well Closure Research Committee (WCRC) focuses on delivering methane emissions reduction and elimination from operations, or operations and closed wells. The challenge of emissions migration through the well infrastructure is of concern to many Oil and Gas producing jurisdictions. This committee works diligently to find new cost effective mitigation technology solutions.

Alexandra Robertson

Ben Fraser

Cassidy Juhasz

Claudette Fedoruk

Dave Samuelson

Jennifer Thompson

Leah Davies

Marci Jacula

Rajan Varughese

Richard Wong

Ryan McDowell

Shawn Forster

Wade Hartzell

Alberta Energy Regulator

Imperial Oil

Crescent Point

Canadian Association of Petroleum Producers

Cenovus Energy

Revitalize Energy

Imperial Oil

Revitalize Energy

Alberta Energy Regulator

Cenovus Energy

Crescent Point Energy

Cenovus Energy

Canadian Natural Resources Limited





PROJECTS LAUNCHED

- *Agronomic Receptors – Phase 3*³
- *Alberta Energy Cleantech Export Program (AECEP)*
- *Alberta Water Tool – Open Access*³
- *Background Soil and Water Data, Saskatchewan*³
- *BWV (Breakwater Vantage) Portal APP*⁴
- *CERAWEEK Trade Mission – Alberta Export Expansion Program (AEEP)*
- *Clean Combustion Combustor Challenge (post-desk top, Phase II)*⁴
- *Controlled Methane Injection Pilot Demonstration of a Biocover Concept for Mitigating Leaking Oil and Gas Wells*³
- *Controlled Tank Investigations*⁴
- *Current State Knowledge regarding Methane Mitigation (Includes: SRC Meta-Analysis of Tank Emissions 2.0)*⁴
- *Data Analytics Platform*⁴
- *Development of a Chloride Water Quality Guideline Based on Hardness and Consideration for Cation Toxicity*³
- *Development or Adaptation of an Existing Sensor Technology to Monitor Leaks in Temporary Surface Pipelines*
- *Dry Gas Seal*⁴
- *EcoSeis Phase 2*³
- *Electrical Showdown Full Trial Phase III*⁴
- *Evaluation of Reclamation Practices on Peatland Wellsites Stage 3, Phase 4B – Research Program*³
- *Evaluation of Soil Chloride Delineation Requirements*³
- *Expanded Correlations Between Hydrometer Data, Sieve Data, and Saturation Percentage Data*⁴
- *Experimental Design Assessment of Methane Slip of Stationary Engines Analysis*³
- *Flowserve DGS Feasibility Study*⁴
- *Gas Migration Measurements for Inventory Accuracy and Well Abandonment*³
- *GRF Grassland Reclamation Forum Recovery Strategy Updates*³
- *Innovation Showcase with CRIN*
- *International Outreach for Methane Emissions Reduction Technologies (CanExport)*
- *METAN/Etter new generation Catalytic Oxidizer PH II*⁴
- *Methane Emission Technology Deployment Proposal*⁴
- *Methane Monitoring Assessment HQP*
- *Methane Slip Study*⁴
- *Methods for Estimates and Emissions from Tanks*³
- *Process Guide for Approaching Salt Contamination*³
- *Quantification of Methane Emission in Stationary Engine Exhaust and Best Management Practices for Mitigation*
- *SRC Net Zero Measurement CNRL*⁴
- *Study of Time-Effective Methane Reduction Solutions for Compressor Station and Equipment Blowdowns*
- *Subsoil Salinity Tool Version 3.0 Technical Manual*³
- *Systematic Third-party Validation (STV) Phase 2 with CRIN*
- *Testing Alternate Products in Place of Cement for Well Decommissioning and Remediation*³
- *Towards Net-Zero Emissions: Mechanics, Processes and Materials to Support Risk-Based Well Decommissioning*³
- *Understanding Tank Vent Emissions 2.0*⁴
- *Using Various Forms of Remote Sensing to Improve our Ability to Manage Risk of Incidental Take for Pileated Woodpeckers*³
- *VITAS / SAIT Computational Model (Accurate Methane Emissions Measurement and Quantification from Petroleum Storage Tanks)*⁴

ONGOING PROJECTS

- *Background Metals and Salinity Database and Analysis Tool*
- *Data Collection & Analysis of Phase II Environmental Site Assessments (ESA) Associated with Drilling Waste Disposal Locations³*
- *Development of a Chloride Water Quality Guideline Based on Hardness and Consideration for Cation Toxicity³*
- *Environmental Sensor Monitoring – Improving the Processing Efficiency of Acoustic Big Data to Support Alberta's Land Managers³*
- *Evaluation of Current & Emerging Emission Quantification Tools³*
- *Evaluation of NOx Emission Abatement Technology Options and Best Management Practices³*
- *Evaluation of Reclamation Practices on Forested Upland and Peatland Well Sites³*
- *Evaluation of Surface Casing Vent Flows at Inactive Wells: Database Analysis and Field Measurements in Alberta³*
- *Finalization of Research and Preliminary Selenium Soil Quality Guideline Derivation³*
- *Investigate the Potential for Surface Casing Vent Flow/Groundwater Migration Issues³*
- *Low-rate Meters⁴*
- *Measurement of Associated Gas and Venting Volumes at CHOPS Sites in Alberta and Saskatchewan (CHOPS GOR)³*
- *Methods for Estimating Emissions from Tanks³*
- *Minimum Acceptable Emissions and Closure Guidelines for Leaking Abandoned Wells³*
- *Pipeline Blowdown Incineration by TC Energy⁴*
- *Plant Uptake of Petroleum Hydrocarbons and Salt (NaCl) and Derivation of Soil-to-Plant Uptake Factors³*
- *Plug and Abandon Strategies for Canada's Oil & Gas Wells to Stop Surface Casing Vent Flow (SCVF) and Gas Migration (GM)³*
- *Quantification of Transient Methane Venting Through Fixed Roof Liquid Storage Tanks Matt Johnson, Carleton University⁴*
- *Re-Evaluation of F2 and F3 Petroleum Hydrocarbon Management Limits³*
- *Regulatory Approval of Risk Assessment Tools*
- *Remote Sensing Tools*
- *Soil and Groundwater Guideline Calculator*
- *Standardizing Risk Assessment Approaches Based on Residual Mass vs. Numerical Endpoints*
- *State of Science on Emission Rate Thresholds for Upstream Petroleum Industry Leaks Corresponding to a Range of ppm Concentration Thresholds³*
- *Testing Alternative Products for Well Remediation and Decommissioning / Abandonment – Phase I³*
- *Understanding Tank Vent Emissions 1.0⁴*
- *Zero Emissions Heavy Oil Brownfield Site by CNRL⁴*





PROJECTS COMPLETED

- *Agronomic Receptor Evaluation for Direct Soil Contact*³
- *Alberta Water Tool – Open Access*³
- *Beyond Visual Line of Sight Demonstration (BVLOS)*
- *Digital Innovation Network*
- *Electric Dump Valve Actuator (EDVA)*
- *Energy UTM*
- *Environmental Sensor Monitoring – Improving the Processing Efficiency of Acoustic Big Data to Support Alberta's Land Managers*³
- *Intelligent Methane Monitoring and mitigation System (IM3S)*
- *Jurisdictional Review: Alternative Water Transfers Using Temporary Layflat Hose*³
- *Methane Consortia Program (MCP)*
- *Methane Emissions Reduction Network (MERN)*
- *NRC-IRAP Client SME Innovation*
- *Plug and Abandon Strategies for Canada's Oil & Gas Wells to stop Surface Casing Vent Flow (SCVF) and Gas Migration (GM)*³
- *Predictive Emissions Management System (PEMS)*
- *Standardizing Risk Assessment Approaches Based on Residual Mass vs. Numerical Endpoints*³
- *Systematic Third-Party Validation (STV)*
- *Targeted PureJet Incinerators for Methane Challenges*
- *Water Use Data Sources and Water Metrics for Canada*³
- *Reduction Pathways Digital Twin*

³ Projects launched by the AUPRF program

⁴ Projects launched as part of the CanERIC network

2022-23 EVENTS



9
EVENTS IN 2022



5
EVENTS IN 2023



8
VIRTUAL EVETNS



6
IN-PERSON
EVENTS



1000+
MEMBERS
ATTENDED

26/04/2022	2022 Virtual Innovation Showcase - Spring In-take
25/05/2022	Canadian UAVs
01/06/2022	AIRmarket Everything you wanted to ask about how Drone Surveillance can affect your asset and sustainability initiatives - but didn't know to ask!
15/06/2022	Methane Emissions Detection & Reduction Technologies
15/06/2022	How Robotic Process Automation (RPA) Creates Step-Change Improvements in Efficiency, Cost Reduction, Safety, and Environmental Operations in Oil & Gas
13/09/2022	25th Annual General Meeting & Awards Celebration
21/09/2022	Virtual Mini Conference: Voluntary Emissions Reduction Initiatives Across the Supply Chain
25/10/2022 - 27/10/2022	Net Zero Conference & Expo
02/12/2022	ERA's Industrial Transformation Challenge webinar
19/01/2023	PTAC Member Event - Soil Remediation Planning
26/01/2023	Digital Spotlight: Actionable outcomes from Artificial Intelligence and Machine Learning
01/03/2023	PTAC Member Event: Embracing AI and Machine Learning on the road to Operating by Exception in Upstream Oil and Gas
06/03/2023-10/03/2023	CERAWeek 2023 Trade Mission Houston, Texas
15/03/2023	PTAC Member Event: Fugitive methane emissions - Technology to monitor and fix leaks faster



MEMBERS

ASSOCIATIONS

- **Alacritty Foundation**
- **Alberta Canada Fusion Technology Alliance**
- **BC Innovation Council**
- **Canadian Association of Petroleum Producers**
- **Environmental Services Association of Alberta**
- **The Explorer and Producer Association of Canada**
- **Project Forest**

EPC

- **Worley Parsons Canada Services Ltd.**

GOVERNMENT

- **Alberta Department of Energy**
- **Alberta Economic Development and Trade**
- **Alberta Energy Regulator**
- **Alberta Environment and Protected Areas**
- **BC Energy Regulator**
- **Global Affairs Canada**
- **Natural Resources Canada**
- **Environment & Climate Change in Canada**
- **Saskatchewan Ministry of Energy and Resources**

INDIVIDUAL

- **Amanda Hehr**
- **Bob Mick**
- **Dave Rushford**
- **Earle Shirley**
- **Eric Lloyd**
- **Gobind N. Khiani**
- **Hafez Balavi**
- **Ken Putt**
- **Larry Frederick**
- **Murray Todd**
- **Robert G MacCuish**
- **Shunde Yin**

LEARNING INSTITUTIONS

- **Carleton University**
- **Southern Alberta Institute of Technology**
- **University of Alberta**
- **University of Calgary**
- **Flux Lab, St. Francis Xavier University**

PRODUCERS

- **Bonavista Energy Corporation**
- **Canadian Natural Resources Limited**
- **Cenovus Energy**
- **Chevron Canada Resources**
- **Imperial Oil Limited**
- **NuVista Energy**
- **Ovintiv (Encana Corporation)**
- **Revitalize Energy Inc.**
- **Suncor Energy Oil Sands Limited Partnership**
- **Teine Energy Ltd.**
- **Whitecap Resources**

RESEARCH PROVIDERS

- **Alberta Innovates**
- **University of Calgary - Alberta Sulphur Research Ltd.**
- **BC Research Inc.**
- **Bureau Veritas**
- **CMC Research Institutes**
- **InnoTech Alberta**
- **Patro Research**
- **Saskatchewan Research Council**
- **Waterline Resources Inc. - Environmental Team**

"Calscan being a technology developer and solution provider to the energy industry, membership in PTAC has been and is a valuable part of our success. PTAC's support in confirming the viability of our technology to energy stakeholders has helped to reduce the deployment time of our solutions as well as introducing our solutions to producers. Providing development initiatives through collaboration with regulators, government, and producers, PTAC has been a conduit for Calscan to provide producers with reliable, cost-effective technology with the highest environmental performance currently available to achieve their ESG goals. PTAC is more than a membership. PTAC and its people are a valued partner of Calscan."

Doug Bezpalko P.L. Eng., Manager Technical Sales, Calscan Solutions

SERVICE & SUPPLY

- **4Blue**
- **AddGlobe LLC**
- **AECOM**
- **AGAT Laboratories**
- **Air Market**
- **Akine Well Optimization Services Inc.**
- **Alberta H2**
- **AMGAS Service Incorporation**
- **Arolytics**
- **Atlantis Research Labs**
- **AVH Engineering**
- **Bridger Photonics**
- **Calscan Energy Limited**
- **Canada Pump and Power Corporation**
- **Canadian UAVs**
- **CanaGas Incorporated**
- **Capstone Oilfield Services Limited**
- **Carbon Accessors**
- **Carbon AI**
- **Carbon Connect International**
- **Challenger Technical Services**
- **CHZero Emissions Ltd.**
- **Clear Rush Co.**
- **Clearstone Engineering Limited**
- **Clearview Downhole Technologies**
- **CNTRAL Inc.**
- **Computer Modelling Group Ltd.**
- **COOEC Canada Company Ltd.**
- **Cream Energy Group**
- **Drift Recource Technologies**
- **DXD Consulting**
- **Eadie Oil Inc.**
- **Earthmaster Environmental Strategies Inc**
- **Emission Rx**
- **Envirosoft**
- **EnviroVault Corporation**
- **Equilibrium Environmental**
- **ETTER Engineering Company Inc.**
- **Expansion Power**
- **Extreme Telematics Corporation**
- **EZOPS Incorporation**
- **First Step Analytics Inc.**
- **FLIR System Incorporation**
- **FluidsData**
- **Fuzeium - Data Analytics**
- **Gas Pro Compression**
- **GCHEM Limited**
- **General Energy Recovery Incorporation**
- **Genetique Solide**
- **geoLOGIC systems Limited**
- **GHGSat Incorporation**
- **Global Power Technologies**
- **H2Sweet Incorporation**
- **Halliburton Group Canada**
- **Hatfield Consultants**
- **Hetek Solutions Inc.**
- **Highwood Emissions Management**
- **Horizon Compliance**
- **HydrocarbonX Inc.**
- **Inversion Point Technologies Ltd.**
- **Ionada Carbon Solutions Limited / ICS Research Corporation**
- **Kinitics Automation Limited**
- **Kuva Systems**
- **LCO Technologies**
- **Linear Motion Technologies Canada**
- **Lux Modus Limited**
- **Marathon Compression Corporation**
- **Matidor**
- **Matrix Solutions Inc.**
- **Maverick Inspection Ltd.**
- **MedEng Research Institute Inc.**
- **Millenium EMS Solutions Ltd.**
- **MLCan Ltd.**
- **Montrose Environmental Group Incorporation**
- **NanoTech Innovation**
- **Nevada Nanotech Systems Inc.**
- **New Paradigm Engineering Limited**
- **North Shore Environmental Consultants**
- **NTWIST Inc.**
- **OilPro Oilfield Production Equipment Ltd.**
- **Onyx Energy Solutions**

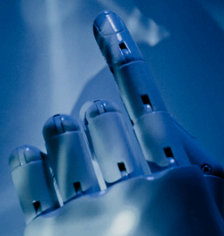
- **OptiSeis Solutions Ltd.**
- **Portfire Associates**
- **Prabhu Energy Labs**
- **Precise Downhole Solutions**
- **Process Ecology Incorporation**
- **Qube Technologies Incorporation**
- **Radicle Balance (Cap-Op Energy /TriCore Carbon Solutions)**
- **Schlumberger Canada Limited**
- **Seal Well Incorporation**
- **SeekOps**
- **Sensirion Connected Solutions**
- **Sensor Up**
- **Sensyn Inc.**
- **SFC Energy LTD**
- **Silvacom**
- **Sirius Instrumentation & Controls Incorporation**
- **SLR Consulting (division-based)**
- **Spartan Controls**
- **Surface Solutions**
- **Tara Energy Services**
- **Telops**
- **Tetra Tech**
- **Theia HDM**
- **Tomahawk Energy Services Limited Partnership**
- **Total Combustion Incorporation**
- **TriAcc**
- **Trido Energy Services**
- **TSGI Corporation**
- **Validere Technologies Inc.**
- **VEERUM**
- **Ventbuster Instruments Incorporation**
- **Vertex**
- **VL Energy Limited**
- **WeldFit**
- **West Country Energy Services, Div of 876919 AB LTD**
- **Westgen Technologies Incorporation**
- **Winterhawk Well Abandonment Limited**

TRANSPORTATION - MIDSTREAM

- **ATCO**
- **TransCanada PipeLines Limited**

VENTURE CAPITAL

- **First Merchants Capital Partners Inc.**





AWARD RECIPIENTS

25TH ANNUAL GENERAL MEETING & AWARDS CELEBRATION

PTAC's Annual General Meeting & Awards Celebration on September 13, 2022, was an opportunity to recognize and honour outstanding members who have significantly contributed to PTAC and its various committees. Eighteen individuals were recognized for their exceptional leadership and service to the oil and gas community.

AIR QUALITY R&D LEADERSHIP AWARD

Amanda Stevado *Environment and Climate Change Canada*

In recognition of providing valuable technical direction and leadership on projects related to industry performance and environmental excellence through the PTAC Air Research Planning Committee.

CANERIC FIELD TESTING LEADERSHIP AWARD

Erin Powell *Saskatchewan Research Council*

In recognition of her role as the Chair of the Infrastructure Steering Committee under CanERIC and her collaborative efforts in stewarding highly technical and variable projects to enable CanERIC to achieve its success. Her execution of projects is appreciated by all the members of CanERIC.

CANERIC FIELD TESTING LEADERSHIP AWARD

Neuczki Mathurin *TC Energy*

In recognition of Neuczki's work in leading various critical projects in CanERIC. She and her team should be commended for their engagement in CanERIC actions, including solving fundamental industry challenges, on-time, on-budget project execution and associated, and timely feedback and reporting.

CHAIRPERSON'S AWARD

Adrian Manlagnit *Natural Resources Canada*

In recognition of Adrian's outstanding leadership and collaborative effort in CERIN's activities, progressing research and technology development, and his commitment to achieving sustainable hydrocarbon development.

COMMERCIALIZING OF SME TECHNOLOGY AWARD

AIRmarket

In collaboration with PTAC, AIRmarket has developed robust and reliable technologies required to permit, approve, monitor, and regulate drone (Remotely Piloted Aircraft Systems - RPAS) flights to ensure public safety and the safety of piloted aircrafts.

ECO-EFFICIENCY LEADERSHIP AWARD

Patrick Kitchin *Whitecap Resources*

In recognition of outstanding collaborative efforts in activities related to the Technology for Emissions Reduction and Eco-Efficiency Committee.

ECOLOGICAL LEADERSHIP AWARD

Jordon Smith *Canadian Natural Resources Limited*

In recognition of proving valuable technical direction and leadership on projects related to industry performance and environmental excellence through the PTAC Ecological Research Planning Committee.

ORGANIZATION LEADERSHIP AWARD

Natural Resources Canada

In recognition of outstanding leadership and guidance in sustainable hydrocarbon development; in particular CERIN's activities to reduce methane emissions.

OUTSTANDING SERVICE AWARD

Justin Riemer *Emissions Reduction Alberta*

In recognition of outstanding service and dedication on the PTAC Board of Directors, and devoted commitment to PTAC's mission and vision.

OUTSTANDING SERVICE AWARD

Laurie Schramm

In recognition of outstanding service and dedication on the PTAC Board of Directors and Executive Committee, and devoted commitment to PTAC's mission and vision.

OUTSTANDING SERVICE AWARD

Laurie Pushor *Alberta Energy Regulator*

In recognition of outstanding service and dedication on the PTAC Board of Directors, and devoted commitment to PTAC's mission and vision.

OUTSTANDING SERVICE AWARD

Lois Garrett

Independent

In recognition of outstanding service and dedication on the PTAC Board of Directors and ad hoc Placement Committee, and devoted commitment to PTAC's mission and vision.

OUTSTANDING SERVICE AWARD

Ken Paulson

Independent

In recognition of outstanding service and dedication on the PTAC Board of Directors and Finance and Audit committee and devoted commitment to achieving sustainable hydrocarbon development

PRESIDENT'S AWARD

Nicole Harbauer

Trade Commission

In recognition of strong support to PTAC and collaborative efforts on increasing market uptake of Canadian methane emissions reduction and detection technologies in global markets.

REMEDIATION AND RECLAMATION RESEARCH LEADERSHIP AWARD

Rick Rohl

ARC Resources

In recognition of providing valuable technical direction and leadership on projects related to industry performance and environmental excellence through the PTAC Remediation Reclamation Research Committee.

WATER INNOVATION LEADERSHIP AWARD

Sarah Belak

Tourmaline

In recognition of providing valuable technical direction and leadership on projects related to industry performance and environmental excellence through the PTAC Water Innovation Planning Committee.

WELL CLOSURE LEADERSHIP AWARD

Ryan McDowell

Crescent Point Energy

In recognition of providing valuable technical direction and leadership on projects related to industry performance and environmental excellence through the PTAC Well Abandonment Research Initiatives Committee.



⁵ Sarah Belak & Soheil Asgarpour - Water Innovation Leadership Award



AUDITOR'S REPORT

To the Directors of Petroleum Technology Alliance Canada

OPINION

We have audited the financial statements of Petroleum Technology Alliance Canada (the "Organization"), which comprise the statement of financial position as at March 31, 2023, and the statements of operations, changes in net assets and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies. In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Organization as at March 31, 2023, and its results of operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

BASIS FOR OPINION

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Organization in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

BDO Canada LLP

PTAC Petroleum Technology Alliance Canada**Statement of Financial Position**

As at March 31,

	2023	2022
ASSETS		
Current		
Cash and cash equivalents	\$ 2,562,254	\$ 2,714,115
Cash and cash equivalents- restricted	8,920,075	3,262,846
Restricted short term investment	-	6,484,970
Goods and services tax receivable	103,595	68,478
Accounts receivable and accrued receivables	2,078,611	787,807
Prepaid expenses	93,736	28,164
	<u>13,758,271</u>	<u>13,346,380</u>
Equipment and intangibles	1,629	2,573
	<u>\$ 13,759,900</u>	<u>\$ 13,348,953</u>
LIABILITIES		
Current		
Accounts payable and accrued liabilities	\$ 3,956,882	\$ 2,166,865
Deferred event revenue	271,311	-
Deferred membership revenue	20,149	80,578
	<u>4,248,342</u>	<u>2,247,443</u>
Deferred contributions	<u>4,378,133</u>	<u>6,453,881</u>
	<u>4,378,133</u>	<u>6,453,881</u>
NET ASSETS		
Invested in equipment and intangibles	1,629	3,792
Internally restricted	3,131,796	2,643,837
Reserve	2,000,000	2,000,000
	<u>5,133,425</u>	<u>4,647,629</u>
	<u>\$ 13,759,900</u>	<u>\$ 13,348,953</u>

PTAC Petroleum Technology Alliance Canada**Statement of Operations**

For the year ended March 31,

	2023	2022
Revenue		
Project and service revenue	\$ 13,796,380	\$ 11,892,217
Event revenue	402,292	40,132
Membership revenue	353,767	290,922
Interest income	155,479	27,242
Miscellaneous income	4,377	367
	<u>14,712,295</u>	<u>12,250,880</u>
Expenses		
Direct project and service costs	12,476,212	10,903,907
Salaries and benefits	1,330,841	1,306,426
Direct event costs	179,877	28,008
Rent	78,598	95,356
Consulting and professional fees	46,579	50,533
Office and equipment leases	33,515	8,792
Insurance	23,296	20,211
Marketing	15,982	4,594
Computer and website	13,297	13,322
Bank charges and credit card discounts	11,972	9,018
Training	8,268	7,746
Volunteer recognition	5,234	7,518
Bad debt	1,884	13,539
Amortization	944	1,715
Realized / unrealized exchange loss	-	5
	<u>14,226,499</u>	<u>12,470,690</u>
Excess (deficit) of revenue over expenses	\$ 485,796	\$ (219,810)

“The ultimate test of man’s conscience may be his willingness to sacrifice something today for future generations whose words of thanks will not be heard.”

– Gaylord Nelson, Former Governor of Wisconsin



PTAC

For more information about PTAC projects,
events, or membership contact us at:

PTAC

Suite 400, Chevron Plaza
500 – 5 Avenue SW
Calgary, Alberta T2P 3L5

Phone: 403.218.7700 | Email: info@ptac.org

