INDUSTRY GRANTS PROGRAM

# METHANE REDUCTION DEMONSTRATION PROGRAM

# INTAKE GUIDELINES

**Submission Deadline**: January 31st, 2026, at 7:00 p.m. EST


NGIF ACCELERATOR

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# 1. Legal Notice

The Methane Reduction Demonstration Program is designed to advance near commercial technologies to help Alberta's oil and gas industry reduce methane emissions faster and cost effectively. This program is funded by Alberta Environment and Protected Areas (AEPA) and NGIF Accelerator and is operated by NGIF Accelerator through its Industry Grant Program. The Industry Grants program is a not-for-profit program operated by NGIF Accelerator ("**NGIF Accelerator**") and is referred to as the "**IG program**" throughout this document. By applying to the Methane Reduction Demonstration Program (the "**Application**"), you confirm that you read, understood, and accepted the information contained in this call for applications (this "**RFP**") and that each of you, the applicant (the "**Applicant**"), and any Project Partners (as defined below), agree as follows:

a) NGIF Accelerator may at any time suspend, terminate, cancel, withdraw, amend, or alter all or any portion of this RFP or any subsequent step in this Application process, including but not limited to application requirements, the selection and review process, and the eligibility criteria.

b) NGIF Accelerator reserves the unqualified right to accept or reject any or all Applications for any reason. NGIF Accelerator is not required to accept any Application recommended for advancement through to any subsequent step in the Application process by the applicable evaluators.

c) The final decision with respect to the Applications to be included in the Application shortlist in this RFP and the decision to advance any Applications to any subsequent step in the Application process rests solely with the IG Program's innovation committee ("**Innovation Committee**"). The Innovation Committee's evaluation of all Applications may be based on, but is not in any way limited to, the criteria set out in this RFP. The Innovation Committee may consider any criteria relevant to the IG Program mandate, regardless of whether such additional criteria have been disclosed to the Applicant.

d) Applications that do not comply with the requirements described in this RFP may be rejected in whole or in part or not considered by NGIF Accelerator. NGIF Accelerator reserves the unqualified right to accept or reject a non-compliant Application.

e) This RFP is not an offer, and submitting an Application does not create a contract or agreement of any kind between NGIF Accelerator and the Applicant.

f) No conduct, act, or omission of NGIF Accelerator or their directors, officers, consultants, project advisors, agents, servants and their respective successors and assigns, other than a notice to the Applicant in writing signed by an authorized person for NGIF Accelerator, will constitute approval of an Application.

g) Approval of an Application does not create any binding contract between NGIF Accelerator and the Applicant. NGIF Accelerator shall not be obligated to the Applicant, and the Applicant shall have no rights in respect of NGIF Accelerator, in any matter whatsoever until a written contribution agreement ("**Contribution Agreement**") between NGIF Accelerator and the Applicant has been duly executed in respect of an approved Application.

h) As between the parties, the Application and all documents and materials the Applicant submits to NGIF Accelerator in connection with this RFP or any subsequent step in the Application process (other than information relating to the Applicant incorporated into the Application but not directly connected to this RFP) are the exclusive property of NGIF Accelerator immediately upon delivery to NGIF Accelerator. For clarity, this refers to the submitted documents and materials, not to any technology or innovations disclosed or discussed in them. Intellectual property developed during the project will be addressed through the Contribution Agreement and will normally be owned by the Applicant.

i) You, the Applicant, and any **"Project Partners**," being organizations responsible for carrying out specific project activities in the manner and scope as agreed between partners, with the lead partner being the Applicant, will keep this application confidential and will not use, reproduce or distribute it, any portion of it, or any data, information, drawings, or specifications included in or provided with it except as necessary to prepare any materials in connection with the IG Program, as requested by NGIF Accelerator. Any breach of the terms of this RFP by an Applicant's Project Partners will be considered a breach by the Applicant.

j) NGIF Accelerator will not have any liability whatsoever to you, the Applicant or any of the Applicant's Project Partners in connection with this RFP or any subsequent stage in the Application process.

k) You, the Applicant, and any Project Partners will not make a claim against NGIF Accelerator for any reason whatsoever or howsoever relating to this RFP or any subsequent stage in the Application process. You are undertaking the expenditures required to prepare and submit an application and you agree that you are making an application at your own risk. You waive any right relating to, and release NGIF Accelerator (and its affiliates) from, any demand, liability, claim, or recovery for costs, expenses, or damages incurred whatsoever or howsoever arising out of or relating to this RFP or any subsequent stage in the Application process, whether such right or claim arises in contract, negligence or otherwise.

l) NGIF Accelerator takes no responsibility for the accuracy of the information supplied in this RFP.

# 2. Introduction

## 2.1 NGIF Accelerator

NGIF Accelerator is the not-for-profit arm of NGIF Capital and operates all technology and innovation programs. The NGIF Accelerator mandate is to de-risk and accelerate technology development by supporting startups through their pilot projects, field trials, and industry validation. It coordinates with federal and provincial governments to co-fund projects to advance market commercialization. NGIF Accelerator currently operates the Industry Grants program and administers the NGIF Emissions Testing Centre program.

## 2.2 Industry Grants Program

The Industry Grants program is industry-led and offers non-dilutive grants to fund early-stage startups for technology development and field demonstration. The program specifically de-risks pre-commercial technology solutions that have the potential to increase the environmental performance of the natural gas sector. Each project in the program will accelerate technology readiness level progressions through pilot testing and field trials to advance commercialization.

The Industry Grants program is operated by the NGIF Accelerator. The IG program has 10 Canadian energy participants, committed to driving cleantech innovation and solutions for the natural gas industry. Our participants include Apex Utilities, ARC Resources, ATCO Gas, Birchcliff Energy Ltd., Canadian Natural Resources Limited, Enbridge Gas Inc., Fortis BC, Pacific Northern Gas, SaskEnergy, and Tourmaline Oil Corp.

## 2.3 Value Proposition – Why You Should Apply

Canada is the 4$^{th}$ largest producer of oil and the 5$^{th}$ largest producer of natural gas producer. Alberta is Canada's largest producer of oil and natural gas and, as a result, methane emissions from the province's oil and gas sector represent a significant portion of the country's total. Reducing methane emissions is one of the most impactful opportunities to improve environmental performance and support Alberta's and Canada's climate commitments. The Industry Grants Program represents some of the largest O&G producers, transmission and distribution companies in Canada. Through the Industry Grants program, the Methane Reduction Demonstration Program offers successful applicants access to pooled public and industry non-dilutive capital, insights on their technology development efforts from industry experts, and industry resources to field test and de-risk their innovations, creating potential future customers.

# 3. Methane Reduction Demonstration Program

The Methane Reduction Demonstration Program offers up to $9MM CAD in total grant funding to eligible recipients globally. Each project demonstrated in Canada may receive up to $750,000 CAD, representing up to 75 percent of eligible project costs. All successful recipients will be required to demonstrate their technologies at one or more of NGIF Accelerator's Industry Grants Program Industry Participants' operations.

The Program will operate through a fixed intake model, with three competitive intakes (cohorts) planned between November 2025 and December 2027. Each cohort cycle will span approximately six to eight months, from intake to project selection. Following evaluation and selection, successful applicants will proceed to a contracting phase where project scopes are refined based on due diligence outcomes. Once contracts are executed, funded projects will commence an eighteen-month delivery period.

Each proposal submitted to the Methane Reduction Demonstration Program will undergo a rigorous evaluation, screening, and selection process. This document provides information, guidance, and requirements for submitting an application under Stage 1 of the Program. Only successful applicants from Stage 1 will be invited to submit a formal project proposal in Stage 2. Unsolicited Stage 2 proposals will not be accepted.

The Methane Reduction Demonstration Program is designed to accelerate the commercialization of high-impact, near-commercial methane detection, quantification, and reduction technologies through a market-driven selection process. Its primary objective is to advance promising innovations from development and pilot-scale validation to demonstration and early-stage commercial deployment. This is achieved by leveraging a combination of public and industry non-dilutive funding, validating performance through strategically selected demonstration sites, and incorporating direct feedback from end-use customers to ensure that product specifications align with market needs.

Technologies supported under this Program are expected to deliver measurable environmental benefits, economic value, and scalability across Alberta's oil and natural gas value chain. The Program emphasizes solutions that address critical industry challenges and align with evolving regulatory requirements, enhancing both operational efficiency and compliance performance.

By facilitating this progression, the Methane Reduction Demonstration Program serves as a critical bridge to broader market readiness and commercial scale-up, laying the foundation for widespread deployment of supported technologies.

The Methane Reduction Demonstration Program is backed by the Government of Alberta through Alberta Environment and Protected Areas (AEPA) and its Technology Innovation and Emissions Reduction (TIER) fund, and is delivered by NGIF Accelerator's Industry Grants program. This program is supported with $7MM in funding from Government of Alberta and $3MM in matching funds from Industry Grants program.

The Methane Reduction Demonstration Program runs concurrently with and complements Emissions Reduction Alberta's (ERA) Methane Reduction Deployment Program, a $22.4MM initiative focused on scaling validated technologies through full deployment. Together, these two programs maximize the impact of methane emissions reduction efforts across Alberta's energy sector by enabling a coordinated progression from technology demonstration to widespread adoption.

## 3.1 Application Submissions – Cohort I

Applications will be accepted on a rolling basis from the competition launch date; however, applicants for the first cohort of the Methane Reduction Demonstration Program must apply online before the submission deadline, January 31st, 2026, at 7:00 p.m. EST.

**Methane Reduction Demonstration Program**: https://www.ngif.ca/methane-reduction-demonstration-program/

**Application portal**: SmartSimple

## 3.2 Finalist Announcements – Cohort I

The finalists for the first Cohort of the Methane Reduction Demonstration Program will be announced in July 2026.

Please refer to Section 8.3 for the full timeline of the cohort and the program.

# 4. Methane Technology Priority Areas

NGIF Accelerator aims to advance leading clean technologies for O&G production (upstream), transmission (midstream), distribution, and end-use applications (downstream). The Methane Reduction Demonstration Program intends to accelerate methane technologies with near to mid-term market potential (less than 1 to 3 years).

The goal is to develop scalable, economically viable technologies that seamlessly integrate into the industry, reducing its methane footprint and enhancing sustainability across all sectors.

Only methane technologies at TRL 7-9 stages of development are considered. Projects at TRL 6 may also be considered provided they exhibit a well defined and accelerated path to commercialization. Technology Priority Areas include:

**Methane Mitigation and Reduction:** including but not limited to vapour recovery units, storage tank emissions control, methane capture solutions, compressor seal improvements, low-bleed/zero emission pneumatics, remote power solutions, flare reduction, surface casing vent flow (SCVF), intermittent destruction technologies.

**Methane Measurement and Quantification (up to 40% of Program Funds):** including but not limited to top-down technologies and land-based technologies.

Further details and technology target key performance indicators are listed in the **Challenge Statement**.

**Please note that the technology solutions of interest indicated in the Challenge Statement and above are not limited to the examples specified**. If you are uncertain about your technology's suitability and relevance, please contact us at mrdp@ngif.ca.

# 5. Stage of Development – Technology Readiness Level

This call for proposals seeks projects to advance methane technologies currently at the Technology Readiness Level (TRL) between 7 and 9. Projects at TRL 6 may also be considered provided they exhibit a well defined and accelerated path to commercialization. The TRL is defined as below:

- **Prototype Testing in relevant environment (TRL 6):** At this stage of development, the technology is tested in a relevant environment. Projects in this category include testing a prototype integrated with existing systems, if applicable, in a simulated operational environment. Engineering feasibility is demonstrated.
- **Field Pilot (TRL 7):** At this stage of development, the technology is ready to be field tested in a controlled operational environment. Projects in this category include the scale up of prototypes to representative pilot scale demonstration and subsequent in-field demonstration testing of pilot units under controlled conditions.
- **Demonstration (TRL 8):** At this stage of development, the technology is approaching the final commercial product, and representative commercial-ready systems have been built. Projects in this category include a demonstration of near or fully commercial-scale systems in an operational environment to support ultimate full commercial, long-term operations.
- **Commercial Implementation (TRL 9):** At this stage, the technology is ready for commercial deployment. Projects in this category will involve the design, construction, and operation of the technology in its final commercial form, with the intent to operate the technology for its full commercial life.

# 6. Funding Terms & Eligibility

NGIF Accelerator funding is provided for the completion of a project with well-defined objectives, milestones, deliverables, and timelines. Applicants must delineate the scope of the project for which the funding is being requested. Any related work completed before the project term or concurrently

but outside the scope of the proposed project may be discussed in the proposal but should be clearly indicated as such.

## 6.1 Total Funds and Project Term

The Methane Reduction Demonstration Program is **offering up to a total of $9MM (CAD) in grants** to support innovative methane reduction technologies serving the oil & natural gas value chain in Alberta - production (upstream sector), transmission (mid-stream sector), and distribution and end-use applications (downstream sector).

## 6.2 Funds per Project

**Eligible projects can apply for up to $750,000 (CAD) per project, representing 75% of the total project cost**. Final approval of funding is made at the sole discretion of the NGIF Accelerator's IG program and the availability of funds.

## 6.3 Cost Sharing

The maximum contribution to a single project will be no more than **75%** of the project's eligible expenses, excluding in-kind contributions.

There must be a minimum contribution from the Applicant to the project-eligible cost in the form of cash, in-kind goods or services, or the combination thereof that demonstrates the capacity and financial commitment of the Applicant to their project.

For information about eligible expenses and costs, please refer to the NGIF Accelerator's IG program's *Eligible Expenses and Cost Instructions* document.

**Note**: Applicants must justify the amount of funding requested. NGIF Accelerator may choose to award project funding for less than the requested amount at its sole discretion.

## 6.4 Project Term

A funded project can last up to **eighteen (18) months** from the execution of the Contribution Agreement.

## 6.5 Project Financial Requirement

Upon successful selection after Stage 2, NGIF Accelerator will execute a Contribution Agreement with the Applicant once the Applicant demonstrates that the balance of project funds is committed and other conditions related to funding are fulfilled. The Applicant shall submit contribution

agreements, financial statements, bank statements, and any other information requested by the NGIF Accelerator to establish whether this balance funding is secured and whether other required conditions are met.

## 6.6 Project Partner Guidelines

The Applicant can partner with other organizations to carry out specific project activities in the manner and scope agreed upon between parties. In such a case, the applicant shall always be the lead partner. Partners can represent companies in the value chain of the technology to be developed and demonstrated.

Collaboration between multiple organizations is eligible and encouraged for this opportunity. Collaboration between partners can often represent a strong value proposition by demonstrating opportunities for technology validation, commercialization, and sharing of results. As such, involvement from industry members is highly encouraged to demonstrate market pull for proposed solutions. Applicants are encouraged to partner with academic and other research institutions where appropriate. These partnerships can offer significant benefits, including the attraction and training of highly skilled workers, increasing Canada's innovation capacity, engagement of the broader innovation ecosystem, and leveraging complementary resources.
The ability to build effective and mutually beneficial relationships with Indigenous Peoples is considered an asset for project evaluations. Thus, NGIF Accelerator encourages projects led by or partnered with First Nations, Inuit, or Métis organizations or communities to apply.

## 6.7 Eligibility

The Methane Reduction Demonstration Program is open to Canadian as well as international small to medium-sized enterprises (SMEs), including technology development start-ups. The following definitions are used to define SMEs and start-ups:

- Small and medium-sized enterprises (SMEs) are non-subsidiary, independent technology development firms that employ fewer than 500 employees.
- Technology development start-ups are non-subsidiary, independent technology development firms that employ fewer than 100 employees, generate less than CAD $25 million in annual revenues, and are primarily focused on developing and scaling up pre-commercial technologies.

## 6.8 International Applicants

The NGIF Accelerator welcomes and encourages applications from innovators and entrepreneurs from all over the world who are developing clean technologies and have a solution that can be directed to the Canadian O&G industry. By applying to this competition, international applications

will have the opportunity to showcase their solutions to Canadian O&G energy industry leaders and potential customers and receive direct industry feedback, mentoring, and project funding support.

Through this competition, international applicants will be able to test, validate, and de-risk their technologies in Canada, which may include projects focused on demonstrating the effectiveness of the technology in the Canadian environment. International applicants without a prior presence in Canada must demonstrate how their proposed project, commercialization plan, and market strategy will lead to deploying solutions in Canada, especially in Alberta. It is not a requirement for any applicant to be a Canadian citizen or have offices in Canada to participate in this competition.

***Exclusions:*** The NGIF Accelerator is currently not accepting applications from countries sanctioned by the Government of Canada *under the United Nations Act (UNA) and Special Economic Measures Act (SEMA)*. Applicants are requested to contact NGIF Accelerator if they plan to subcontract any portion of their work on their project to any countries on the list.

## 6.9 Project Location

Approved projects should be demonstrated in Alberta, Canada. All projects selected for funding must be demonstrated at a site owned or operated by one of the IG program's industry members.

Applicants do not need to have identified a project location during Stage 1 of the evaluation process. Discussions on the project location are introduced in Stage 2 of the evaluation process by NGIF Accelerator. However, applicants are encouraged to establish relationships with potential demonstration sites and indicate their preference for a project partner in their application if one is available.

# 7. Funding Leverage through Trusted Partners

The NGIF Accelerator has working relationships with other federal and provincial funding organizations across Canada. In some cases, the NGIF Accelerator may be able to share Applicants' proposals with trusted partners and explore possibilities for leveraging funding available from these organizations. The NGIF Accelerator has a "Trusted Partnership" with the following organizations:

- Natural Resources Canada (NRCan)
- Emissions Reduction Alberta (ERA)
- Alberta Innovates (AI)
- Province of British Columbia Innovative Clean Energy ICE Fund (ICE Fund)
- Geoscience BC
- Innovation Saskatchewan
- Ontario Centre of Innovation

# 8. Submission Details

## 8.1 Submission Deadline

Applicants can submit an online application on a rolling basis. All applications must be submitted before the following deadlines to be considered for evaluation:

**Cohort I - Submission Deadline: January 31st, 2026 at 7:00 p.m. Eastern Standard Time (EST)**

The online application portal can be accessed at the NGIF website here.

## 8.2 Submission Standards

Applicants shall submit a complete and comprehensive online application. As this is a competitive process, the quality of submission in terms of innovativeness, clarity, completeness, and relevance to the O&G gas sector will be assessed. Applicants with incomplete and non-clear submissions will be rejected at the sole discretion of the NGIF Accelerator.

## 8.3 Timeline

The following timelines are anticipated on the funding competition. Note that IG program reserves the right to alter or cancel the currently anticipated process and deadlines.

| Process Step | By Whom | Date |
|---|---|---|
| **COHORT I** | | |
| **Program launch** | NGIF Accelerator | 12th Nov, 2025 |
| **Informational webinar** | NGIF Accelerator | 26th Nov, 2025<br>Dec 19, 2025<br>Jan 14, 2026 |
| **Deadline: Expression of Interest applications due** | **Applicant** | **31st Jan , 2026** |
| **Application Notification for Accept/Non-Accept to progress to Stage 2** | NGIF Accelerator | Mar, 2026 |
| **Deadline: Stage 2 full proposal submission** | **Applicant** | **Apr, 2026** |
| **Site Visits for successful Stage 2 applicants** | NGIF Accelerator / Applicant | Apr, 2026 |
| **Stage 2 finalist selection** | NGIF Accelerator | Jul, 2026 |
| **Funding decision announcements** | NGIF Accelerator | Jul, 2026 |
| | | |
| **Future Cohort Expected Timelines** | | |
| **Cohort II – Expression of Interest Deadline** | NGIF Accelerator | Sept, 2026 |

# 9. Evaluation Framework

## 9.1 Project Screening

Applications for Stage 1 will be screened to ensure they meet the following factors:

- The project is innovative and advances beyond business as usual for the O&G gas sector.
- The proposed technology development has sufficient potential for demonstration or deployment for application in Canada's O&G gas sector.
- The Applicant meets the Program's eligibility criteriaError! Reference source not found.
- Sufficient information is provided for proper evaluation.
- The project's Technology Readiness Level (TRL) (beginning and end) is provided. Applicants are highly recommended to establish their technology's current TRL.
- The written application is comprehensible and provides a compelling case for the commercialization potential of the technology.

## 9.2 Project Evaluation – Intake Stage 1

Screened applications in Stage 1 will be evaluated based on the following criteria:

1. Project objective and scope including: Technology innovation (scientific basis, intellectual property, and the unique value proposition compared to incumbent competing technologies).
2. Relevance to the O&G value chain (value proposition for the end-user, environmental benefits, business case – economics of the technology and the addressable market).
3. Project work plan - a clear and appropriate work plan indicating how key technology development and commercialization success levers and constraints will be identified, prioritized, and addressed through the work plan.
4. Demonstration of the technology pathway to commercial deployment.
5. Project financing and budget (project funding and financial strength).
6. Management capability of the company and the project partners:

    - Strong and relevant technical and commercial experience, a track record of attracting investors and strategic partners, managing projects of similar size and complexity.
    - Robust project management team with all relevant project delivery resources and partners.

## 9.3 Evaluation Process and Next Steps

The Methane Reduction Demonstration Program launches a unified, gated process to fast-track methane reduction technologies from pilot to commercial scale.

Gate 1 includes market driven evaluation through Industry Grants program's robust stage gated evaluation process – Stage 1 Intake Stage and Stage 2 Evaluation Stage.

Gate 2, backed by the Government of Alberta, provides TIER matching funding to approved Industry Grants projects. An independent committee of experts will assess each project against the TIER mandate to reduce greenhouse gas emissions intensity from Alberta's industrial facilities for TIER funding consideration.

Applicants must go through BOTH gates of evaluation before being approved for funding. A fully executed Contribution Agreement will be required before funds are released.

Applicants who are rated highly in Stage 1 Intake are determined to be of sufficient quality, and are well aligned with the competition's mandate will be invited to submit a Stage 2 application.

Further information regarding the Stage 2 submission, including evaluation criteria and timelines, will be made available at the time the Stage 2 invitations are made.

***Note on Proposal Quality:***

This is a highly competitive process, and not all projects will be short-listed for Stage 2. Success at Stage 1 depends on the quality of the application submitted. Only high-quality applications will be invited to submit Stage 2 proposals. In this regard, "quality" means both the quality of the proposed project relative to the evaluation criteria and the quality of the written proposal (clarity, completeness, etc.).

The following will also be reviewed when determining whether to approve the application for the next stage of evaluation:

- The rubric on the online application portal is followed.
- Complete information is provided as per this guidelines document.
- The project plan is comprehensively laid out in the online application.
- The cost and the budget for the project are outlined and justified.

# 10. Intellectual Property

Intellectual property will be addressed through the Contribution Agreement negotiated between NGIF Accelerator and the successful Applicant and will be specific to the circumstances of each project. However, a few general principles apply:

- Background IP (patents, copyright, software) and third-party technology remain with its original owner(s);
- All IP Rights in Project IP remains vested in the Applicant; and
- NGIF Accelerator retains non-exclusive use rights to the project research results, including, without limitation, the technical data, reports, analysis, and discussion.

# 11. Confidentiality

NGIF Accelerator shall keep confidential all information disclosed to them by the other party relating to this invitation or approved project, except information which:

- is part of the public domain.
- becomes part of the public domain other than as a result of a breach of these provisions by either party.
- either party is required to disclose pursuant to applicable Laws or by a Governmental Authority.
- can be demonstrated to have been known or available to either party or independently developed by either party.
- was received in good faith from an independent person who was lawfully in possession of such information free of any obligation of confidence; or
- is released in accordance with the provisions of the Methane Reduction Demonstration Program Contribution Agreement or by the written authorization of both parties.

# 12. Additional Information

For more information on NGIF Accelerator, Industry Grants program or the Methane Reduction Demonstration Program, please visit ngif.ca. Questions for the Methane Reduction Demonstration Program can be sent to mrdp@ngif.ca.

NGIF ACCELERATOR

INDUSTRY GRANTS PROGRAM

# METHANE REDUCTION DEMONSTRATION PROGRAM

## CHALLENGE STATEMENT


Canadian Natural
ENBRIDGE
FORTIS BC
Energy at work
PNG
PACIFIC NORTHERN GAS
SaskEnergy
TOURMALINE
CGA
APEX UTILITIES INC
ARC RESOURCES LTD.
ATCO
BIRCHCLIFF ENERGY
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## 1. Introduction

The oil and gas industry, spanning upstream (exploration and production), midstream (transportation and distribution), and downstream (commercial and residential consumers), is essential to supply global energy needs; the industry requires innovative technology solutions to provide lower emissions energy to support national and international greenhouse gas reduction ambitions. Methane, a potent greenhouse gas, can be released at different parts of the natural gas value chain. Effective management of methane emissions is critical for the industry's environmental sustainability and regulatory compliance requirements. The Methane Reduction Demonstration Program seeks innovative solutions for:

A. Methane Mitigation and Reduction
B. Methane Measurement and Quantification

specifically designed for the unique needs of the natural gas value chain.

## 2. Challenge Statement

The oil and gas industry is seeking transformative technologies to detect, quantify, and reduce methane emissions across upstream, midstream, and downstream operations. This includes advanced methods for real-time monitoring and data analysis, deployment of state-of-the-art hardware for methane detection and quantification, and innovative solutions for mitigating methane emissions from various sources.

The goal is to develop scalable, economically viable technologies that seamlessly integrate into the industry, reducing its methane footprint and enhancing sustainability across all sectors.

The following are guided measures for submitting innovative solutions/ technologies to the Methane Reduction Demonstration Program. Measures include:

1. **Problem-Solution fit:** Technologies must solve painful problems in the upstream oil and gas and natural gas transmissions and distribution & end use value chain.
2. **Performance and Cost Efficiency:** Technologies should be able to demonstrate comparable performance metrics and cost structure to incumbent technologies.
3. **Integration with Existing Operations:** Technologies should have minimal impact on existing operations or offer beneficial integration opportunities. Technologies at all stages of technical maturity are of interest.
4. **Methane Detection Accuracy:** Technologies should achieve high accuracy in detecting and quantifying methane emissions, with minimal false positives/negatives compared to incumbents.

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## 3. Areas of Interest

### 3.1 Methane Mitigation and Reduction

- ***Vapor Recovery Units (VRUs):*** Technologies to recover vapours, including ejector-based, cryogenic, and membrane-based vapour recovery systems.
- ***Storage Tank Emissions Control:*** Solutions such as internal and external floating roofs and low-emission tank seals. Upstream process controls and inlet alternatives. Tank venting combustion or oxidation.
- ***Vented Methane Capture Solutions:*** Pressure Swing Adsorption (PSA), Temperature Swing Adsorption (TSA), activated carbon fiber adsorption beds, and Metal-Organic Framework (MOF) adsorbents.
- ***Compressor Seal Improvements:*** Innovations in dry gas seals, advanced wet seals, hybrid seal systems, carbon ring seals, and real-time seal monitoring systems.
- ***Zero Emission Pneumatic Controllers:*** Technologies like electric actuators, solar-powered pneumatic controllers, and instrument air systems.
- ***Flare Reduction:*** Enclosed ground flares, micro-LNG production units, gas-to-wire technologies, gas reinjection systems, and methane-to-methanol conversion units
- ***Surface Casing Vent Flow (SCVF)/Gas Migration Prevention or Mitigation:*** Solutions including thermosetting polymer sealants, expandable tubular liners, cement squeeze techniques, casing patch systems, and wellbore integrity logging tools.
- ***Catalytic Heater Improvement or Alternative:*** Improve oxidation efficiency to >95% for natural gas-fueled heaters that can be deployed to Class I, Division 1 & 2, Group D hazardous locations. Evidence that >95% oxidation efficiency is maintained for product life (~10 years).
- ***Intermittent methane emissions destruction technologies:*** Technologies to destroy small intermittent quantities of methane (such as those from pneumatic instruments or compressor seals).
- ***Compressor Package Methane Emission Reduction:*** Advancements such as oxidation catalysts with extended service life, after-treatment systems tailored for natural gas engines and methane-selective membranes. Solutions that integrate retrofit capabilities for legacy compressor fleets. Digital solutions that minimize methane emissions during transient operations are of particular interest.
- *Other innovative methane solutions tailored to address emissions from Compressors Stations, Engine Exhaust, Fugitives, Glycol Dehydrators, Well workover & completion, Pipelines and Metering stations*

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## 3.2 Methane Measurement and Quantification

- ***Quantification Solutions:***
    - Software and digital solutions for real-time monitoring and data analysis with the goal of providing business intelligence that will help drive mitigating methane emissions. Methane prediction schemes employing machine learning algorithms or custom data-set creations are of particular interest
    - Hardware such as laser-based systems, infrared cameras, and other related camera or technologies that leverage spectroscopy.
    - Utilization of gas chromatography technology for precise methane detection.
    - Solutions that give operators the ability to improve localization of fugitives to the component or equipment level.
- ***LDAR (Leak Detection and Repair) Technologies:***
    - **Top-down Measurement Technologies:**
        - Drones for aerial methane sensing (targeting emissions less than 10 kg/h, targeting 1 kg/h or less).
        - Arial for long-range pipeline surveys (targeting emissions less than 10 kg/h, targeting 1 kg/h or less).
        - Satellites for aerial methane plume detection. (Targeting emissions less than 150kg/h)
        - Continuous methane detection solutions for tower platforms
    - **Land-based Measurement Technologies:**
        - Point sensors (fixed or portable) for specific location monitoring.
        - Handheld Optical Gas Imaging (OGI) and other technologies for continuous on-site methane leak detection, visualization and quantification.
        - Mobile ground labs (vehicles) equipped with advanced detection instruments for on-the-go monitoring.
    - Other innovative software/hardware integration technologies for comprehensive monitoring and reporting.

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