Methane Emissions Reduction, Baseline Opportunity Assessment (BOA) and Leak Detection and Repair (LDAR) Studies and Direct to Capital (DTC) Applications Engineering Guidelines

Table of Contents

1. Methane Emissions Reduction (MER) Engineering Guidelines

Overview of the Initiative

1.1 Purpose

This guideline provides the minimum requirements for delivering Baseline Opportunity Assessment (BOA) and Leak Detection and Repair (LDAR) Studies and Direct to Capital (DTC) Applications as part of the Methane Emissions Reduction (MER) Initiative offered by Energy Efficiency Alberta. MER Initiative is primarily focused on identification, reduction, improvement and/or elimination of methane emissions in the Oil & Gas industry in Alberta. Our Technical Reviewers will be able to complete the review of the BOA and LDAR Studies and/or DTC Applications Reports (DTC Reports) in a timely manner, provided all the information described in this guideline are included, and by ensuring the information provided is complete and accurate. The Reports shall meet the technical, financial and commercial analyses outlined below. The technical review process, as part of the MER Initiative, is subject to external audit, as such we are committed to delivering GHG reductions that can be verified using principles following the International Performance Measurement and Verification Protocol (IPMVP) standards or equivalent.

1.2 Scope

Methane is the main constituent of natural gas with a 100-year global warming potential (GWP) estimated to be 25 times greater than carbon dioxide (CO_2).

The scope of this document pertains to documenting the identified GHG reductions as a result of the MER Initiative, from vents, leaks, inefficient combustion/flaring/incinerating and natural gas consuming/processing equipment at Oil & Gas facilities, by developing engineering deliverables associated with methane emission reduction measures (ERMs). The BOA and LDAR Studies involve an in-depth detailed assessment/analysis of fugitive emissions, leak detection and repair, detailed facility inventory count, emissions quantification and natural gas use at facilities with the purpose of identifying quick and easy verifiable emission reductions, as well as capital opportunities for further financial and engineering analysis.

Possible Direct to Capital (DTC) Applications - Methane ERM opportunities include, but are not limited to, the following:

DTC Applications (DTC Studies & DTC Projects) - Methane ERM
Wellhead casing seal repair
Test and repair pressure safety valves
Glycol dehydration system upgrades
Vapour recovery unit
Pneumatic injection pumps to solar or grid
Air/fuel ratio controls
Vent gas capture
High efficiency boiler upgrade

Pneumatic to electric (grid, solar, fuel cell) retrofit
Pneumatic (fuel gas) to instrument air conversion
Compressor seal retrofits

DTC Applications resulting in the identification and implementation of energy reduction opportunities at Oil & Gas facilities are not within the current scope of the MER Initiative; however, they are eligible under Energy Efficiency Alberta's Custom Energy Solutions (CES) Program.

1.3 Overall Eligibility

The following eligibility requirements apply to participants performing BOA and LDAR Studies and/or DTC Applications, and their associated Reports:

- The facility where the work is performed shall be located in Alberta.
- Facility owner is classified as one with production from all facilities in the Oil & Gas sector within the province of Alberta not exceeding 40,000 boe/day.
- Incentive funding up to $250,000 available per Facility Owner/program year (up to March 31st, 2019).
- Facilities designated as Large Final Emitters (LFE) or are not eligible to participate in the Initiative.
- Potential capital projects that are registered to generate offsets (per approved Alberta Quantification Protocols) under Carbon Competitiveness Incentive Regulation program for carbon offset incentives are not eligible to participate for DTC Applications under the MER Initiative.
- MER Initiative does not support any requirements (studies or project initiatives) that have been deemed mandatory by Alberta Energy Regulator (AER) and/or other provincial regulatory bodies.

Applications must be made online through the Facility Owner Log In or Program Ally (PA) Log In (https://cr107.secure.force.com/ies/).

To be qualified for the MER Initiative, each Program Ally needs to fulfill the criteria prescribed in the MER Program Ally onboarding document.

An initiative participant can submit a DTC Application for a facility without having performed BOA and LDAR Studies first. All DTC Applications will be held to high standards and level of detail requirements.

1.4 Initiative Incentives

BOA and LDAR Studies and DTC Applications must focus exclusively on realizing LDAR savings, and identification and implementation of MER opportunities, respectively, to be eligible for incentives under MER Initiative.

1.4.1 Baseline Opportunity Assessment (BOA) and Leak Detection and Repair (LDAR) Studies Incentives

Incentives for BOA and LDAR Studies are based on the facility type(s) and number of facilities included in the BOA and LDAR Studies application. A single BOA and LDAR Studies application may include a combination of facility types and multiple Facility Owners. BOA and LDAR Studies incentives per facility type will be paid based on below incentives:

Facility Type	Typical Incentive ($)
Single Well Site	$600
Multi Well Site	$1,200
Battery Site	$1,800
Gathering Site	$2,300
Processing Plant	$5,000

While there is no limit to the number of facilities per Facility Owner for each application, BOA and LDAR Studies along with final Report (format described under section 2.5) of all facilities surveyed must be completed and submitted to Energy Efficiency Alberta within 30 days of pre-approval. Program Allies should consider staging of applications to ensure completion of studies on a timely basis.

Upon approval of the final BOA and LDAR Studies Report, a payment for the approved incentive amount will be awarded to the Program Ally in accordance with the following structure:

- For sites where leaks are identified and repaired on-the-spot with documentation provided, 100% of incentive is paid.
- For sites where no leaks were identified, 100% of incentive is paid.
- For sites where leaks are identified with reasonable explanation of why repairs cannot occur is provided, 100% of incentive is paid. Examples of justifications: shutdown schedule, lack of resources, health and security, or environmental concerns.
- For sites where repairs will occur at a later date:
    - 50% of incentive released for work orders initiated and signed by Facility Owner either with the final BOA & LDAR report or separately within 15 days of final report submission.
    - Remaining 50% incentive is paid upon receipt of Work Order signed by contractor/operator who repaired the leak within 30 days of work order initiation.

1.4.2 Direct to Capital (DTC) Applications Incentive

DTC Applications are initiated by a Program Ally or a Facility Owner as a single application and includes a DTC Studies component and a DTC Projects component. Both DTC Studies and DTC Projects are mandatory components within the DTC Applications. A DTC Projects component cannot be submitted without a DTC Studies component, nor can a DTC Studies component be submitted without the intent of completing a DTC Projects component of DTC Applications. As such, the DTC Applications incentives are two-fold; one for the Studies and one for the Projects.

Program Allies and/or Facility Owners who submit a DTC Applications will receive 50% of the incentives upon final DTC Report approval and the remaining 50% upon completion, submittal and acceptance of post install verification report and provided all the DTC Report requirements listed in section **3.5** have been met.

DTC Studies incentives are paid as follows:

- Payable to Program Allies (if used) or Facility owners
- Must demonstrate verified GHG reductions**
- Up to a maximum of $8,000 per Study

DTC Projects incentives are paid based on verified GHG reductions:

- 50% of the Facility Owner's total external out of pocket cost for the project
- Must demonstrate verified GHG reductions**
- Up to a maximum of $250,000*** per Facility Owner per Initiative year (ending March 31, 2019) *

* Year 1 to March 31, 2019 incentive.

** Projects must achieve a minimum GHG reduction performance based on typical equipment operation

*** Inclusive of all MER Initiative incentives (BOA and LDAR Studies, DTC Studies, and DTC Projects)

Incentives for Year 2 and Year 3 of the Initiative, starting April 1, 2019 and April 1, 2020, respectively, are subject to change.

Upon submission and approval of DTC Applications, a payment of 50% of DTC Studies and DTC Projects incentive is paid upfront to the Facility Owner with the remaining 50% being paid post-project installation and verification. A minimum methane emission reduction savings of 500 tonnes per application must be documented to receive the DTC Studies and DTC Projects incentives.

Incentives rates are valid for 90 days from the date of the application approval notification issued by the MER Initiative. Projects requiring more than the 90 days allotted time to verify GHG reductions will be subject to the prevailing incentive rates.

1.5 General

The following are general requirements for Reports related to the MER Initiative:

- The Reports shall be dated and include revision control.
- The DTC Report shall be reviewed and approved by a Professional Engineer in good standing with APEGA.
- Final BOA and LDAR Studies Report shall include BOA Data Capture Template with all required fields completed with supporting documentation and final Report summarizing findings.
- The system boundaries shall be limited to the permanently installed location of the equipment/device under consideration. Opportunities for GHG reduction shall be limited to savings realized by the operation of the proposed system.

1.6 Engineering Standards & Conversion Factors

The following outlines the engineering standards and conversion factor requirements related to the MER Initiative:

- All Reports shall be completed using units indicated in this guideline and templates provided.
- Units used in the analysis/calculation shall be clearly indicated.
- Capital and operation cost shall be quoted in Canadian Dollar.
- Energy use and savings shall be reported as shown in Table 1 below.

Table 1: Metric units for energy usage and savings

Fuel Type	Description	Units
Electricity	Annual energy consumed/savings	Kilowatt hours per year (kWh/yr) or megawatt hours per year (MWh/yr)
Natural Gas	Annual energy consumed/savings	Gigajoule per year (GJ/yr)
Process/Fuel Gas	Annual energy consumed/savings	Cubic meter per year (m^3/yr) (at STP*)

*Standard temperature and pressure (STP)

Refer to the following websites for standard metric units and conversion factors:

https://apps.neb-one.gc.ca/Conversion/conversion-tables.aspx?GoCTemplateCulture=en-CA&wbdisable=true%20-%202-6

and

http://www.nrcan.gc.ca/energy/international/nacei/18057

The following grid displacement and emission factors, shown in Table 2, apply in general. Refer to the Carbon Offset Emission Factor Handbook published by the Government of Alberta for the most recent and comprehensive list.

Table 2: Grid displacement and emission factors

Energy Source	Description	Tonnes Carbon Dioxide Equivalent Displaced or Emission Factor
Electricity	Reduction/Increase in grid electricity use	0.64 tCO_2e/MWh
Natural Gas	Combustion of natural gas	1.918 kg CO_2/m^3 or 0.05110 tCO_2/GJ[1]
Process/Fuel Gas	Reduction in release to atmosphere	0.0179 tCO_2e/m^3 (@STP)[2]

[1] *Based on energy content (Higher heating Value) of natural gas of 37.53 GJ/10^3m^3*

[2] *Pure methane*

2. Baseline Opportunity Assessment (BOA) and Leak Detection and Repair (LDAR) Studies Incentive

2.1 Purpose

The purpose of a BOA and LDAR Studies is to assist the Facility Owners in compiling a detailed quantified inventory of their methane emissions and end uses from vents, leaks, inefficient combustion/flaring/incinerating and natural gas consuming/processing equipment at Oil & Gas facilities and realize on the spot GHG savings from LDAR (mandatory). The BOA and LDAR Studies shall be performed by a qualified MER Program Ally (PA) to complete the following:

1) Conduct leak detection and repair (LDAR)

2) BOA and LDAR Studies Data Capture Template

3) Develop a BOA and LDAR Studies Summary Report categorizing emission sources for identification of future potential capital investment opportunities for each facility surveyed.

BOA and LDAR Studies are initiated with a Program Ally identifying the facility type and the number of facilities covered under the application. Multiple facilities with different Facility Owners can be batched under one BOA and LDAR Studies application. Facility types are categorized as follows:

- Single Well Site
- Multi Well Site
- Battery Site
- Gathering Site
- Processing Plant

The following facility sub-types per AER/Petrinex ID definition is grouped under above noted categories:

- Single Well Site includes:
  - Single well facility gas / oil / bitumen
  - Single satellite facility gas / oil / bitumen
  - Single well facility injection / disposal – Enhanced Recovery well
- Multi-Well Site type includes:
  - Multi-well facility gas / oil / bitumen
  - Multi-satellite facility gas / oil / bitumen
  - Multi-well facility injection / disposal – Enhanced Recovery wells
- Battery Site type includes:
  - Battery facility (single or multi-well) gas / oil / bitumen / water
  - Injection/disposal facility - Enhanced Recovery facility within a battery
- Gathering Site type includes:
  - Compressor station
  - Meter station
  - Gas gathering system
- Processing Plant type include:

- Gas processing plant
- Gas fractionation plant
- Sulphur recovery gas plant
- Straddle plant
- Treatment facilities
- Terminals

The scope of BOA and LDAR Studies includes, but not limited to the following:

- Perform detailed site inventory count (including complete identification/quantification of fugitive emissions, device/equipment make/model #, vent rates) as required per BOA Data Capture Template requirements noted under Appendix A with site/facility Operator input.
- Complete device/equipment specific vent measurements and establish vent/emission rates based on direct measurement or calculated (industry/manufacturer/engineered data) values.
- Complete LDAR by adhering to the following general process:
  - Identifying components → leak definition → monitoring/quantification → repairs & verification → recordkeeping.
- Complete LDAR with operator sign off (e.g. work orders) for reported and on the spot repaired leaks. Quantified methane emission savings associated with repairs to be clearly outlined as part of final Report submission.
- Provide site counts where no leaks were found with justification (as applicable).
- Provide Work Orders initiated and signed by Facility Owner for leaks where repairs occur at later date either with final BOA & LDAR report or separately (within 15 days upon final report submission). Actual leak repairs must be implemented by contractor/operator within 30 days timeline upon Work Order initiation. Work Order signed by the person implemented the actual leak repair must be provided and should include the following minimum information:
  - Facility Owner's address, phone, email
  - Work Order #
  - Work Order date/Expected repair start and end dates
  - Site type
  - Site specific location (LSD)
  - Repair recommendation
  - Leak tag #
  - Process block
  - Component main type
  - Emission rate, cfm
  - Work order initiated by (name/signature/date)
  - Leak repair completed by (name/signature/date)

- Complete reasonable explanation of why repairs cannot occur for sites where leaks identified. Examples of justifications could be shutdown schedule, lack of resources, health and security or environmental concerns.
- Provide recommendation(s) on the step(s) forward for the repairs that cannot be completed on the spot or as part of Work Order initiation process.

As part of the outcomes of the BOA and LDAR Studies, the Facility Owner will receive a detailed Report that will include a complete BOA Data Capture Template (inventory count) and a Report outlining emissions summary per site that was surveyed. Additionally, the Report will contain necessary supporting documentation for all associated vent rates/emission factors noted (measured/calculated) and media files associated with leaks that were repaired on the spot.

An interested Facility Owner may not know what MER opportunities exist at their facility or if the potential opportunity they have in mind can translate into tangible MERs. The BOA and LDAR Studies are available to help Facility Owners evaluate their list of methane reduction opportunities and rank them based on internal and financial priorities, while having all the easy opportunities implemented as part of the outcomes (i.e LDAR).

The BOA and LDAR Studies Report will provide the Facility Owner with an overall emissions summary per facility and their associated sources, potentially leading to MER DTC Applications. This enables the Facility Owner to proceed with a detailed analysis via DTC Applications and its associated incentives to prioritize capital projects which will provide quantified avoided methane emission estimates and the business case.

2.2 Eligibility Criteria & Study Requirements

The eligibility criteria for participating in BOA and LDAR Studies, over and above the criteria mentioned in Section 1.3., are:

- The BOA and LDAR Studies shall be performed by a qualified MER Program Ally.
- BOA and LDAR Studies application form:
    - The BOA and LDAR Studies application form shall be completed in its entirety per application instructions prior to submission for pre-approval.
    - The BOA and LDAR Studies application shall define the number, type of facilities and associated Facility Owner(s) information.
    - Confirmation of operator presence while performing BOA and LDAR Studies to verify, identify & implement LDAR and note appropriate operating conditions/equipment information onto BOA Data Capture Template.
- BOA and LDAR Data Capture Template & Report:
    - BOA Data Capture Template shall be populated in its entirety with relevant supporting documentation & Facility/site Operator/Inspector input included within the final Report for submission.
- Final BOA and LDAR Studies Report shall be submitted to Energy Efficiency Alberta within 30 days of BOA and LDAR Studies application pre-approval.
- GHG savings from LDAR is mandatory per BOA and LDAR Studies application to receive final incentives. Program Allies to provide detailed justification/reasoning for repairs not completed.
- Program Allies must provide supporting documentation that outline reliable and appropriate leak detection techniques or equipment when conducting inspections and surveys including confirmation that a component is no longer leaking. Decisions to repair or replace leaking components based on leak detection performed should be evaluated with the Facility Owner's operator on a case by case basis in

consideration of health, safety, environmental and operational concerns. Where a major shutdown is required to facilitate the repair, or where there are marginal economic justifications for fixing the leak, the repair or replacement may be delayed until the next planned shutdown, provided this does not pose any safety, health, or environmental concerns. This information shall be captured on the BOA and LDAR Studies Data Capture Template and Report prior to final submission.

- Program Allies shall implement physical tagging or other alternative methods to identify leaking components for repairs and that tags be removed once the integrity of the repair has been confirmed. Tags (chemical resistant) shall include as a minimum; unique serial #, description of emission source and quantified emission rate. Tags shall be attached as close as possible to the emission source and made visible to facility personnel.

- When using hydrocarbon leak imaging infrared cameras, Program Allies shall implement the following best practices to ensure best results achieved from LDAR:

    - Be within 6 metres for all components (tank tops can be viewed at further distances but should be at the minimum distance required to view tank-top components, usually not greater than 30 metres from the base of the tank);
    - Inspect components perpendicular to the wind direction;
    - Use an appropriate lens to monitor tank-top components (a fixed lens of 70 millimetres or more should be used on tank tops when viewing from distances approaching 30 metres);
    - View at multiple angles;
    - Account for interference from sunlight, precipitation, wind, and ambient temperatures.

- Leak-rate measurement methods may include flow capture and metering systems (e.g., calibrated bags, thermal mass flow, QOGI, Hi Flow® Sampler, Calscan Hawk and others such as turbine meters, ultrasonic gas flow meters, diaphragm meters, rotameters, and optical flow meters). The methods used to quantify leaks must be documented in the final Report for each facility.

- Other techniques or equipment that provide an equivalent leak detection capability are permissible, but the Program Allies must demonstrate equivalence to the MER Initiative team as part of the PA onboarding process.

- A Program Ally may only use calculated leak rates for sources of leaks that have demonstrable safety issues or technical challenges (e.g., tank-top fittings) and/or for devices/equipment that has statistically significant representative sample for that particular instrument/equipment make/model per Industry/Manufacturer data. The basis of calculations provided by the Program Ally (eg. Dehydration – gas release rate) must be documented in the final Report for each site/facility.

- Direct measurement is the preferred methodology for leak quantification.

- For all leaks identified:

    - Leaks that can be repaired on the spot must be identified and repaired (as reasonably possible) by the Operator including supporting media file(s). Media files attached to the Report (initial survey and after repair) must be labelled with the OGI media file # matching the number identified in the BOA Data Capture Template. These media files will be uploaded by the Program Ally onto a designated secured web-based platform;
    - For leaks that are not immediately repaired, the Program Ally must clearly identify the leak for subsequent repair and repair recommendation;

- Repair recommendations for leaks that cannot be repaired on the spot must be noted for future implementation by the Facility Owner.

2.3 Proposal Requirements

All proposals for BOA and LDAR Studies shall include the following with the application form:

- Enrollment Application (EA) number
- Program Ally contact information
- Facility Owner(s) name, address, designation, contact name(s), telephone number(s)
- List of known potential emission reduction measures (if any) based on Facility Owner input for future capital project implementation
- Facility Owner confirmation with supporting documentation that production for all facilities within Alberta is less than 40,000 boe/day
- Facility information (location, category etc.)
- Facility Operator contact information
- Provide Facility Owner acknowledgement & confirmation to permit Program Allies to proceed with BOA and LDAR Studies work for listed sites (include supporting docs eg. email confirmation, memo etc.)
- Provide supporting documentation from Facility Owner confirming assignment of Facility Owner's inspector presence during site visits with Program Allies
- Provide acknowledgement that company/site specific safety orientation has been completed prior to commencement of work with supporting documentation
- Information of person responsible for signing off on final BOA and LDAR Studies Report
- Anticipated start & end date for BOA and LDAR Studies
- Itemized cost breakdown by facility type

2.4 Application Process

All BOA and LDAR Studies applications will be tracked in Demand Side Management Tracking (DSMT) platform. All logged applications by Program Allies (on behalf of Facility Owners) will be screened for necessary completeness of information provided. Initial application intake process will be conducted by program coordinators.

Due to the rapid implementation of the MER Initiative, it is requested that through November 26, 2018 Program Allies download the MER application for the BOA and LDAR Studies incentive in excel format from the Energy Efficiency Alberta website. Complete the application per the instructions provided and submit completed applications to methanereduction@efficiencyalberta.ca

Effective November 26, 2018 BOA and LDAR Studies applications will be submitted online via the Energy Efficiency Alberta Application Portal.

I. Application Intake & Administrative review

Prior to November 26th, 2018: Apply by completing BOA and LDAR Studies application form in excel format available at Energy Efficiency Alberta's website and submitting completed application forms with supporting documentation to methanereduction@efficiencyalberta.ca

Post November 26th, 2018: Apply online by registering and filling out an application through the application portal (https://cr107.secure.force.com/ies/).

During this process the application will receive an enrollment application number MER-XXXXX. Reference previous enrollment application numbers, if applicable.

At a minimum the application will be verified for:

- Facility Owner(s) name and Facility(s) address within Alberta
- The Facility(s) is not an LFE
- Facility Owner has production from all facilities within Alberta less than 40,000 boe/day
- Number of site/facility(s) and associated categories noted
- Facility Owner & Program Ally sign off
- All supporting documentation requested in BOA and LDAR Studies application form is supplied.
- Costs and proposed project completion timeline

II. Technical Review

During this process, the application and the supporting proposal will be reviewed by MER Initiative engineers to qualify the BOA and LDAR Studies for approval. This submittal, at a minimum, shall include all information as described in Section 0. The BOA and LDAR Studies approval will then be sent back to the program coordinators for processing.

III. BOA and LDAR Studies Approval

BOA and LDAR Studies technical screening and BOA and LDAR Studies pre-approval, incentive letter will be sent to the Program Ally upon approval.

2.5 BOA and LDAR Studies Report Structure

This section describes the minimum requirements and minimum content that shall be included in the final BOA and LDAR Studies Report generated per Facility Owner. This information describes the standard format of the Initiative BOA and LDAR Studies Report template (Appendix A) for all Initiative participants. The intent is not to limit or prescribe the services provided, but to ensure the completeness and quality of the information presented to the MER Initiative.

1. **Executive Summary**

a. Start and end date of BOA and LDAR Studies

b. Summary of facilities surveyed which are included in the Report along with breakdown of identified emissions categories (leaks, pneumatic devices, compressors, chemical injection pumps, tanks and dehydration units) per facility to indicate potential emission reduction measures for future implementation, where available. Total reduced methane emissions from completed LDAR and breakdown of repairs by category (leak type, equipment, etc.)

2. **BOA and LDAR Studies Identification Details**

a. Enrollment Application (EA) number

b. Facility Owner(s) Information

- Legal company name
- Name of parent company, if applicable
- LSD & UWI (if applicable)
- Nine-digit Business Number (BN) or Tax Identification Number (TIN)

c. Facilities Summary

This table is used to summarize number of facility types covered under the BOA and LDAR Studies application per Facility Owner.

3. **Leak Detection and Repair – Inspection Results**

a. Summary of the inspection results. This section outlines the number and volume of leaks detected at each LSD as well as the number and volume of leaks repaired on the spot as a result of the BOA and LDAR Studies activities. All leaks must be documented via Optical Gas Imaging (OGI) recorded video. Documentation to be attached as part of the BOA and LDAR Studies Report deliverables.

b. Summary of sites with no leaks identified with justification.

c. Summary of sites with leaks that will be repaired at later date. Work Orders initiated and signed by Facility Owner for leaks where repairs will occur at later date either with final BOA & LDAR report or separately (within 15 days upon final report submission) must be provided. Actual leak repairs must be implemented by contractor/operator within 30 days timeline of Work Order initiation. Work Order signed by the person who implemented the actual leak repair must be provided.

d. Summary of sites with leaks that cannot be repaired. Reasonable explanation of why repairs cannot occur for sites where leaks were identified must be provided. Examples of justifications could be: shutdown schedule, lack of resources, health and security or environmental concerns.

4. **Equipment Inventory**

Provide a full inventory of methane leaking/venting and consuming equipment observed at each facility included in the BOA and LDAR Studies. The equipment types to be included include:

- Pneumatic Devices
- Chemical Injection Pumps
- Tanks
- Compressors
- Dehydrators

5. **MER DTC Opportunities**

The BOA and LDAR Studies Report will provide the Facility Owner with an overall emissions summary per facility and their associated sources, with recommendation for potential projects which may be eligible for incentives through MER DTC Applications. These recommendations enable the Facility Owner to proceed with a detailed analysis via DTC Applications and its associated incentives to prioritize capital projects which will provide quantified avoided methane emission estimates and the business case.

6. **Report Sign-off**

7. **Funding Options**

This section is prepopulated with additional MER Initiative funding details and Custom Energy Solutions (CES) program funding details available from Energy Efficiency Alberta.

8. **Appendices and Attachments**

a. Completed BOA and LDAR Data Capture Template

b. Record of leak tags

c. Provide picture of each site/facility LSD plaque surveyed.

d. Documentation of detected leaks via OGI recorded video, documentation of quantified leak or vents via the appropriate measurement device (e.g. data file from Calscan Hawk system or record of output from Hi Flow® Sampler). Media files attached to the Report (initial survey and after repair) must be labelled with the OGI media file # matching the number identified in the BOA Data Capture Template. These media files will be uploaded by the Program Ally onto a designated secured web-based platform.

3. Direct to Capital (DTC) Applications

3.1 Purpose

The purpose of MER DTC Applications is to implement known potential capital projects (existing or a result of completed BOA and LDAR Studies) which target the reduction of natural gas consumption and emissions from Oil & Gas facilities.

DTC Applications are initiated by a Program Ally or a Facility Owner as a single application and consists of two components: DTC Studies and DTC Projects. Both DTC Studies and DTC Projects are mandatory as part of the DTC Applications. A Program Ally or Facility Owner cannot submit DTC Projects without DTC Studies, nor can DTC Studies be submitted without the intent of completing DTC Projects. DTC Applications are expected to undergo the following mandatory 3 steps:

- An initial DTC Application proposal is submitted for review and pre-approval for a qualified Oil & Gas facility which outlines potential / existing opportunities for MER.

- A DTC Report is submitted for approval within 30 days of the proposal pre-approval date and is expected to provide a detailed analysis for the intended emission reduction measures. A DTC Report cannot be submitted directly without prior pre-approval of the DTC Applications proposal.
- Final MER post-project implementation documents are submitted within 90 days of the DTC Report approval, which confirms the results of MER savings achieved.

DTC Studies are required to have a +/- 15 % accuracy, or better, in comparison to post install verification with regards to:

- GHG reduction
- Project capital cost

3.2 Eligibility Criteria

The eligibility criteria for implementing DTC Applications, over and above the criteria mentioned in Section 0, are:

- Itemized fixed fee proposal meeting the detailed requirements outlined in Section 0.
- DTC Applications shall be performed by a qualified MER Program Ally and/or a registered Facility Owner.
- The application shall provide a detailed calculated assessment of methane emissions reduction as well as any other fuel consumption impacts (i.e. fuel switching).
- The baseline will follow the historical, comparison, performance, projection based or equivalent methodology for methane emission quantification.
- DTC Report will be completed and, at minimum, conform to the MER Initiative study requirements outlined in Section 0 within 30 days of DTC Applications proposal pre-approval. Final post implementation documents are to be submitted within 90 days of the DTC Report approval.
- Multiple sites of a Facility Owner can be aggregated under one DTC Applications proposal.
- Confirmation of Facility Owner approval to implement the DTC Applications.
- A minimum methane emission reduction savings of 500 tonnes/ application must be documented to receive the DTC Studies incentive and DTC Projects incentive, as described above in Section 1.4.2.

3.3 Proposal Requirements

All proposals for MER DTC Applications shall include the following:

- Enrollment Application (EA) number
- Facility Owner(s) name, address, contact name(s), telephone number(s)
- Facility information (location, category etc.)
- Facility Owner confirmation with supporting documentation that production for all facilities within Alberta is less than 40,000 boe/day
- Most recent available 12-month energy use of facility/system(s) under review
- 12-month production data
- Brief facility description (incl. construction, operations, etc. as applicable to end-uses)
- Detailed description of systems under review
- Emission Reduction Measures (ERMs) to be analysed in the final DTC Report

- Estimate of GHG reductions that can be achieved under scope of work
- Proposed methodology for estimating/analysing the ERMs
- Information of person responsible for signing off on the capital project
- Itemized cost breakdown by tasks, roles, hours and hourly rates (excl. taxes)
- Itemized cost breakdown for equipment including vendor quotes
- List estimated study disbursements/expenses separately
- Limitations of proposal, system(s) excluded

3.4 Application Process

All DTC Applications will be tracked in DSMT platform. All logged applications by Facility Owners or Program Allies (on behalf of Facility Owners) will be screened for necessary completeness of information provided. Initial application intake process will be conducted by program coordinators.

I. Application Intake & Administrative review

Apply online by registering and filling out an application at: https://cr107.secure.force.com/ies/.

During this process the application will receive an enrollment application number EA-XXXXX. Reference previous enrollment application numbers, if applicable.

At a minimum the application will be verified for:

- Facility Owner name and Facility address within Alberta.
- That the Facility Owner has minimum 12 months of energy use and production information.
- The Facility is not an LFE.
- Facility Owner has production for all facilities within Alberta less than 40,000 boe/day
- Measures included in the application.
- Costs and proposed project completion time.

II. Technical Review

During this process, the application and the supporting proposal will be reviewed by MER Initiative engineers to qualify the DTC Studies and associated DTC Projects for pre-approval. This submittal, at a minimum, shall include all information as described in Section 3.3. The DTC Applications proposal pre-approval will then be sent back to the program coordinators for processing and the applicant will be notified accordingly.

III. DTC Applications Approval

The DTC Report which details the DTC Studies outcomes and outlines the DTC Projects to be completed will undergo technical screening and separate DTC Studies and DTC Projects incentive letters will be sent to the Program Ally (if used) and Facility Owner upon approval. The initial 50% of DTC Studies incentive payment and the initial 50% of DTC Projects incentive payment will be granted after DTC Report approval. The Facility Owner will then have 90 days to implement the project.

IV. DTC Post-Implementation Approval

The DTC post-implementation documentation will be reviewed to confirm the GHG reduction claimed and final incentive letters will be issued. The remaining 50% of DTC Studies incentive payment and the remaining 50% of DTC Projects incentive payment will be granted.

3.5 MER DTC Report Structure

This section describes the minimum requirements and minimum content that shall be included in the final DTC Report. This information is required to create a standard format for all Initiative participants. The intent is not to limit or prescribe the services provided, but to ensure the completeness and quality of the information presented to the MER Initiative.

I. Executive Summary

a. Summary of DTC Studies and associated DTC Projects – include a high-level description of the business case of the measure(s)

Tabulate Capital Project results:

- Identifier
- Name
- Methane emission reduction (m^3/yr)
- Electrical savings (kWh/yr) – (if applicable)
- Natural gas savings (GJ/yr)
- Fuel savings (e.g. L/yr)
- GHG reduction (tonnes CO_2e/yr)
- Dollar savings ($/yr)
- Capital cost ($)

b. Date of site visit(s) – note date(s) of site visit(s)

c. Recommendations

d. Next steps

II. Facility Owner Information

a. Legal company name

b. Name of parent company, if applicable

c. Facility name

d. Unique site identifier (LSD) or facility address

e. Utility account numbers (if applicable)

f. Business Number (BN) or Tax Identification Number (TIN)

III. Contact Information

a. Facility Owner – Site contact name, title, address, phone number, e-mail address

b. Consultant – Company name, contact name, title, address, phone number, e-mail address

IV. Facility and System Descriptions

a. Description of facility, systems and processes using/processing natural gas

b. Major equipment/load list – refer to unique identifiers

c. Annual production data

d. Annual operation data

e. Other pertinent facility information

V. Methane End-use Breakdown

a. Site/Facility specific gas composition

b. Independent variables affecting natural gas use (weather, production, etc.)

VI. Methane Emission Reduction Measures

Provide uniquely identified descriptions of the measures identified

a. Define baseline

b. Technical description of measures

c. Methodology used in estimating the savings

d. Assumption made in calculating savings

e. Capital cost estimates

f. Tabulate Capital Projects results:

- Identifier
- Name
- Fugitive methane emission reduction (m^3/yr)
- Electrical savings (kWh/yr) – (if applicable)
- Natural gas savings (GJ/yr)
- Other fuel savings (e.g. L/yr)
- GHG reduction (tonnes CO_2e/yr)
- Dollar savings ($/yr)
- Capital cost ($)

g. Next steps/action items

h. Describe non-energy benefits of measures

VII. M&V Consideration – include description of how DTC Studies and associated DTC Projects can be measured and verified using principles that align with IPMVP standards or equivalent. Include description of instrumentation required and independent variables affecting methane use/intensity.

VIII. Conclusions

IX. Appendix

a. Detailed facility equipment and methane emission inventory

b. Vendor quotes

c. Shop drawings

d. Billing/Production Data

e. Technical references

X. Additional Requirements

The following information shall be included with the submission of the DTC Report:

- Fully accessible native electronic copies of the measure analysis/calculations
- Analysis/calculations shall be systematic and easy to follow/review (workbooks with only values and no explanation how values are derived will be rejected)
- Methodology shall be clear and based on sound engineering principles).
- All assumptions shall be stated
- Any supporting documentation (i.e. site measurements, shop drawings, vendor and installation quotes, etc.)

The baseline(s) for the identified DTC Studies and associated DTC Projects shall be based on sub-metering (or available historical data) of the relevant system(s) for a duration of time sufficient to obtain a representative energy use profile providing a high degree of confidence. Major independent variables significantly affecting the baseline shall be identified and included in the analysis.

The interactive effects between different energy sources shall be included in the analysis and report.

The interactive effects between DTC Studies and DTC Projects, when bundled, shall be included in the analysis and report.

Cost estimates shall be supported by comprehensive vendor and/or installation quotes or by engineering cost estimates. Project costs shall include all cost required to move a project from concept stage through to being fully operational.

3.6 MER DTC Post-Project Implementation Documentation

The DTC Post-Project Implementation Documentation will be required before the final incentive letter is issued to the Program Ally or Facility Owner for DTC Studies incentive and to the Facility Owner for DTC Projects incentive. The following list describes examples of records and documentation needed to verify the GHG savings achieved:

- Work Order of the different equipment change-out and repairs done
- Post-Install commissioning record
- Copy of the Measurement & Verification records
- Copy of billing and production record
- Compelling additional supporting documentation.

Appendix A

BOA and LDAR Data Capture Template (excel format)

Appendix B

BOA and LDAR Report Template (word format)