STRATEGIC ENERGY MANAGEMENT
FOR INDUSTRY

Capital Retrofits (CR)
Application Guide

EMISSIONS REDUCTION ALBERTA
Natural Resources Canada
Ressources naturelles Canada
Alberta

STRATEGIC ENERGY MANAGEMENT FOR INDUSTRY

The purpose of the Capital Retrofits (CR) Application Guide ("Guide") is to provide you with step-by-step guidance on how to participate in the CR activity of the Strategic Energy Management for Industry (SEMI) Program. The Guide is intended to provide the following:

- Provide an overview of the SEMI program and the various eligible activities
- Provide detailed information on the CR Activity including the registration process

Please contact our program support team if you have questions or would like more information:

- Website: https://www.eralberta.ca/semi
- Email: semi@eralberta.ca
- Phone: 1-844-407-0025

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STRATEGIC ENERGY MANAGEMENT FOR INDUSTRY

SEMI Program Overview

Emissions Reduction Alberta's Strategic Energy Management for Industry program (SEMI) helps eligible industrial facilities improve their energy performance by co-funding activities to implement an integrated system of practices, processes, and capital retrofits.

With funding from the Government of Alberta's Technology Innovation and Emissions Reduction (TIER) fund and Natural Resources Canada (NRCan), the objective of SEMI is to support eligible facilities to:

- Understand energy use;
- Identify methods and approaches to optimize energy use;
- Implement energy-saving capital retrofits; and
- Improve energy productivity and competitiveness.

SEMI offers financial incentives that cover up to 50% of eligible project costs for for-profit organizations and up to 100% for not-for-profits and Indigenous organizations. Additional funding caps are stated on the SEMI website. SEMI also allows in-kind contributions from the facility to offset the co-funding requirement for certain activities.

SEMI is structured around five key activities to drive energy efficiency and emissions reduction in industrial and manufacturing facilities:

1. FACILITY READINESS ASSESSMENT (FRA)

The first step in SEMI is to complete a Facility Readiness Assessment (FRA) at your facility. For-profit organizations must cover 50% of the cost; however, it is anticipated that your contributions can be provided as an in-kind contribution. In-kind contributions can include facility staff time necessary to complete any aspect of the FRA and prior energy management activities that contribute value to eligible activities. The FRA will provide you with recommendations to implement further eligible activities Not all recommendations are mandatory to implement for participation in SEMI.

The FRA provides a facility-wide assessment of how, where, and when energy is used in the production process. The FRA will:

- **Provide an energy assessment. The FRA will assess and analyze** all energy uses and energy management systems.
- **Identify opportunities for improvement.** The FRA will highlight immediate opportunities to enhance energy efficiency and provide an energy roadmap for the facility based on site-specific considerations.
- **Define a path forward in SEMI.** The FRA identifies the most suitable next steps of eligible SEMI activities such as further detailed studies, engaging in strategic energy management (SEM), implementing energy management information systems (EMIS), and/or initiating capital retrofits. The path forward will consider the current situation and the capabilities and capacity of your facility, including financial considerations and other constraints. Not all of the next steps identified are mandatory to implement for participation in SEMI.

2. ENERGY ASSESSMENTS AND AUDITS (EAA)

After completing the FRA, facilities may proceed with more detailed studies. These studies can include:

- **Comprehensive Energy Assessment (CEA):** This assessment thoroughly evaluates the facility's overall energy consumption, pinpointing inefficiencies and suggesting targeted energy-saving strategies. The CEA is facility-wide and provides further detailed analysis of energy-saving opportunities. The scope of a CEA may include systems that operate across the facility.
- **Computational Fluid Dynamics Studies (CFDS):** CFDS involve using advanced simulation techniques to model and analyze thermal and fluid dynamics within industrial processes. These studies help to optimize energy use by identifying areas where energy losses occur and suggesting modifications to improve energy efficiency.
- **Process Integration Studies (PIS):** This approach focuses on optimizing the interactions between different processes to reduce energy consumption. PIS analyze how energy flows through the entire facility, looking for opportunities to reuse waste energy, improve heat exchange systems, and streamline operations for better energy efficiency.

3. STRATEGIC ENERGY MANAGEMENT (SEM)

The FRA contains an initial assessment of a facility's readiness to participate in Strategic Energy Management (SEM). The assessment allows a facility to be placed within the correct SEM group training with a customized curriculum. SEM is a systematic approach to energy management that integrates energy-saving practices into the daily operations of a facility. SEM supports facilities in developing and implementing long-term energy management plans that align with their business objectives. This approach includes:

- **Setting Clear Goals**: Establishing measurable energy performance targets and creating a roadmap to achieve them.
- **Engaging Employees**: Involving employees at all levels to foster a culture of continuous improvement and energy awareness.
- **Continuous Monitoring**: Encouraging regular monitoring and reviewing of energy use to ensure that energy efficiency remains a priority and that opportunities for improvement are continually identified.

4. ENERGY MANAGEMENT INFORMATION SYSTEMS (EMIS)

The FRA contains an initial assessment of the facility's Energy Management Information Systems (EMIS). These systems are critical tools within the SEMI framework, providing facilities with the ability to collect, analyze, and manage energy data to inform operating decisions. EMIS activities include hardware and software components that support:

- **Data Collection and Monitoring**: Using sensors, meters, and software to gather real-time data on energy consumption and production levels.
- **Analysis and Optimization**: Analyzing data to identify inefficiencies, track energy consumption patterns, and optimize processes.
- **Reporting and Decision Making**: Providing insights into energy use, which helps in making informed decisions, detecting anomalies, and implementing corrective actions promptly.

5. CAPITAL RETROFITS

The FRA will provide additional insight to support capital retrofits. Capital retrofits are essential for implementing the energy-saving measures identified through the energy assessments or studies and supported by SEM and EMIS. SEMI provides co-funding to assist facilities in upgrading energy-efficient equipment, adopting advanced technologies, and making infrastructure improvements that contribute to reduced energy consumption and lower greenhouse gas (GHG) emissions. Examples of capital retrofits include:

- **Equipment Upgrades**: Installing high-efficiency electric motors with variable frequency drive controls, LED lighting, and waste heat recovery systems.
- **Renewable Energy**: Investing in renewable energy sources, such as solar panels, to reduce dependence on non-renewable energy.
- **Process Improvements**: Upgrading a facility's energy consuming processes, such as improved compressed air systems or upgraded process cooling to enhance energy efficiency.

By integrating these five activities—FRA, EAA, SEM, EMIS, and Capital Retrofits—SEMI offers a comprehensive approach to energy management. This approach enables industrial and manufacturing facilities to optimize energy use, reduce costs, and lower their environmental impact, contributing to a more sustainable and competitive industrial sector in Alberta.

Capital Retrofits (CR) Overview

Capital Retrofits are investments in plant and equipment that improve the energy efficiency of your facility. The retrofit must be a permanent upgrade to replace or improve the performance of existing equipment that results in reduced energy consumption and emission reductions. The equipment must be located in your facility boundary including the manufacturing process and the associated buildings, such as administrative offices. There are two primary groups of eligible equipment:

NON-FOSSIL FUEL BASED PROCESSES (NON-EMITTING SOURCES)

All improvements and upgrades to the plant or equipment that use non-emitting sources are eligible. The improvements may include replacement of the equipment or parts thereof, process control improvements, or alterations to the equipment. Examples include improvements and upgrades to electrically driven systems or that use renewable energy sources.

FOSSIL FUEL BASED PROCESSES (EMITTING SOURCES)

Improvements to systems powered by emitting sources are eligible if the improvement is associated to the distribution network, heat exchangers, heat recovery, or energy waste reduction. Upgrades to the equipment converting the fossil fuels to energy are ineligible.

PRODUCTION RATE INCREASES

For a facility undergoing a production rate increase, eligible expenditures include project expenses directly tied to energy-efficient upgrades, such as equipment and installation costs. Measurement and verification will be used to confirm energy savings by comparing post-project energy consumption against a baseline that represents what energy use would have been at the original production level. This approach isolates efficiency gains by accounting for increased capacity without inflating the saving calculations.

ELIGIBLE EXPENDITURES

Eligible Expenditures must be directly related to design, selection, purchase and installation of the Capital Retrofits. The following costs may be eligible:

- Capital expenditures;
- Professional services, such as scientific, technical, management, construction, engineering, training, project management, logistics, maintenance, and contracting services;
- Data collection services, including processing, analysis and data management;
- Meter purchase, design, installation and configuration costs associated with implementing the Measurement and Verification Reporting (M&VR);
- Travel, including meals and accommodation, based on National Joint Council Rates;
- License fees, data purchases, certification costs, regulatory compliance, inspection costs, construction insurance, and permits;
- Costs associated with environmental assessments;
- Any reasonable expenditure as may be determined by ERA's Service Provider, Enerva Energy Solutions Inc., during the application review.

Eligibility Requirements

1. ELIGIBLE PARTICIPANTS

An eligible participant must meet the two following eligibility requirements:

1. Operates a business - whether as a corporation, non-profit, co-operative, sole proprietorship, partnership, government or public entity, or Indigenous-owned* organization - by owning or leasing at least one Eligible Facility.

*To be considered Indigenous owned, your organization must meet the following criteria:

- *Be a sole proprietorship, limited company, cooperative, partnership, or not-for-profit organization in which Indigenous peoples own and control at least 51% of the enterprise.*

2. Is not insolvent.

2. ELIGIBLE FACILITIES

To be an eligible facility, a facility must meet all the following requirements:

1. The facility is located in Alberta.
2. The facility has been in operation for at least one year with fixed equipment and energy consumption information.
3. You own or lease the facility. For a leased facility, you have obtained permission from your landlord to undertake the key activities.
4. The facility belongs to one of the following North American Industry Classification System (NAICS) economic sectors[1]:

[1] Sectors may also include those that are engaged in energy consuming processes, and that involve the physical or chemical transformation of materials or substances into new products. Products may be finished (ready to use or consume) or semi-finished (raw material). Related activities include assembling component parts, blending materials, and finishing products.

- **Agriculture, Forestry, Fishing, and Hunting (NAICS 11)**
  - Crop Production
  - Animal Production and Aquaculture
  - Forestry and Logging
  - Fishing, Hunting, and Trapping
  - Support Activities for Agriculture and Forestry
- **Mining, Oil, and Gas (NAICS 21)**
  - Oil and Gas Extraction
  - Mining (except Oil and Gas)
  - Support Activities for Mining
- **Utilities (NAICS 22)**
  - Electric Power Generation, Transmission, and Distribution
  - Natural Gas Distribution
  - Water, Sewage, and Other Systems
- **Construction (NAICS 23)**
  - Construction of Buildings
  - Heavy and Civil Engineering Construction
  - Specialty Trade Contractors
- **Manufacturing (NAICS 31-33)**
  - Food Manufacturing
  - Beverage and Tobacco Product Manufacturing
  - Textile Mills
  - Textile Product Mills
  - Apparel Manufacturing
  - Leather and Allied Product Manufacturing
  - Wood Product Manufacturing
  - Paper Manufacturing
  - Printing and Related Support Activities
  - Petroleum and Coal Products Manufacturing
  - Chemical Manufacturing
  - Plastics and Rubber Products Manufacturing
  - Nonmetallic Mineral Product Manufacturing
  - Primary Metal Manufacturing
  - Fabricated Metal Product Manufacturing
  - Machinery Manufacturing
  - Computer and Electronic Product Manufacturing
  - Electrical Equipment, Appliance, and Component Manufacturing
  - Transportation Equipment Manufacturing
  - Furniture and Related Product Manufacturing
  - Miscellaneous Manufacturing
- **Transportation (NAICS 48)**
  - Air Transportation
  - Rail Transportation
  - Water Transportation
  - Truck Transportation
  - Transit and Ground Passenger Transportation
  - Pipeline Transportation
  - Scenic and Sightseeing Transportation
  - Support Activities for Transportation
- **Services and Waste Management (NAICS 56)**
  - Administrative and Support Services (including office, travel, and employment services)
  - Waste Collection
  - Waste Treatment and Disposal
  - Remediation and Other Waste Management Services

3. ELIGIBLE CONTRACTORS

Eligible Contractors are companies approved or certified by SEMI program to perform certain types of work, such as energy studies, energy efficiency upgrades, or renewable energy installations under the SEMI program.

4. ELIGIBLE CAPITAL RETROFITS

The following capital retrofit activities are considered eligible under SEMI:

1. Support modifications or upgrading of a facility's energy-consuming systems and equipment (stationary and mobile), processes, infrastructure, or existing building envelope.
2. Includes (but not limited to) production process systems, compressed air systems, domestic and process hot water systems, fan and pump systems, heating and ventilating and air-conditioning systems, lighting systems, process furnaces, dryers and kilns, refrigeration systems, and steam and condensate systems and waste heat recovery, as well as metering equipment, automation, and control systems (instrumentation and software).
3. Must be non-emitting (e.g., use energy sources such as electricity, renewable energy / biomass, hydrogen, etc. resulting in zero GHG emissions at end use).

4. Projects that reduce fossil fuel consumption and GHG emissions within a system powered by fossil fuel may be eligible. However, projects that solely focus on improving the efficiency of fossil fuel powered equipment such as replacing a boiler with a more efficient boiler are ineligible.

   Examples of eligible Capital Retrofits related to systems consuming fossil fuels include:

   a. Steam trap replacements, as steam traps are part of the steam system and do not rely solely on fossil fuels for operation.
   b. Installation of heat recovery systems since they focus on enhancing energy efficiency without being limited to fossil fuel-powered equipment.
   c. Process-wide energy efficiency improvements, such as optimizing heat exchanger networks to improve overall system efficiency.

5. If the equipment is using a mix of non-emitting energy and fossil fuels, ERA will review eligibility on a case-by-case basis.
6. Have a combined payback period of greater than one year at a single industrial facility.
7. Comply with ERA's Measurement and Verification (M&VR) Guideline for SEMI.
8. Demonstrate energy and GHG emissions reductions, with a minimum 5% target energy and 5% GHG emissions reductions compared to the system.

Before submitting your application, contact ERA's Service Provider if you have any questions regarding the eligibility of your retrofit.

Capital Retrofit Application Process

The Capital Retrofit registration process is easy and secure. Please complete the registration form on the SEMI online portal ("Portal") at www.semiprogram.ca. The process flow below outlines the main steps for the Capital Retrofit.

STEP 1
SUBMIT THE CAPITAL RETROFITS APPLICATION

STEP 2
APPLICATION REVIEW BY ERA'S SERVICE PROVIDER

STEP 3
CONFIRM CAPITAL RETROFITS SCOPE AND BUDGET, SIGN TERMS & CONDITIONS

STEP 4
IMPLEMENT CAPITAL RETOFITS IN YOUR FACILITY

STEP 5
SUBMIT THE MEASUREMENT & VERIFICATION DATA AND GET YOUR RETROFIT VERIFIED

STEP 6
SUBMIT INVOICES AND RECEIVE INCENTIVE

STEP 1: SUBMIT THE CAPITAL RETROFITS APPLICATION

- Use the SEMI Portal to submit your Capital Retrofits application. The application should be supported by following documents:
  - A feasibility study that that describes the existing system, the proposed retrofit and the estimated energy saving/ GHG reduction.
  - Minimum of 12 months of energy consumption data for the applicable system(s) in Excel format.
  - Capital Retrofit cost estimate supported by vendor quotes for major cost items.
  - Retrofit implementation schedule including important milestones[2].
- Select Eligible Contractor(s) to
  - Implement Capital Retrofits in your facility.
  - To certify successful installation and operation of Capital Retrofits in your facility.
- Submit the necessary documentation for review by ERA's Service Provider. Any missing information will delay your submission. Contact ERA's Service Provider for any questions.
- After you click the submit button, you will receive an acknowledgement e-mail stating that your application has been submitted and is under review.

Tip: Your Eligible Contractor can submit the Capital Retrofits application on your behalf.

STEP 2: APPLICATION REVIEW BY ERA'S SERVICE PROVIDER

- ERA's Service Provider will review the submitted documents to confirm the reasonableness of the energy savings/GHG reduction and retrofit cost estimate stated in the application. ERA's Service Provider may reach out to you to request any additional information required to complete the review.
- It will take up to 30 business days to review your application depending upon the retrofit scope.
- Once ERA's Service Provider has completed the review, you will be notified of the successful completion of the review. The e-mail will include an estimate of the eligible incentive, and a date by which you are expected to complete the retrofit.

STEP 3: CONFIRM CAPITAL RETROFITS SCOPE AND BUDGET, SIGN TERMS & CONDITIONS

- The approval e-mail from ERA's Service Provider will include a link to the SEMI Capital Terms & Conditions document.
- The document contains the Terms & Conditions for Capital Retrofits, with following fields populated by the ERA's Service Provider:
  - Schedule A – Capital Retrofits Scope & Estimated Savings
  - Schedule B – Projected Eligible Expenditure
  - Schedule C – Co-Funding Details
- Review, sign and date the document and upload the completed document on the portal.

STEP 4: IMPLEMENT CAPITAL RETROFITS IN YOUR FACILITY

- After signing the Terms & Conditions document, you can begin implementing the retrofits as per the scope outlined in the application documents.
- Notify ERA in case of
  - Any change in the retrofit scope
  - Any delays in the retrofit schedule
  - Any factors leading to retrofit underperformance

Tip: Your Eligible Contractor can submit the Capital Retrofits scope change request on your behalf.

STEP 5: SUBMIT THE MEASUREMENT & VERIFICATION DATA AND GET YOUR RETROFIT VERIFIED

- Once your retrofit has been successfully installed and commissioned, ask the eligible contractor to verify the successful operation of your retrofit.
- The eligible contractor will perform a site inspection to ensure that the retrofit:
  - Is installed as per the scope outlined in your application.
  - Is operating as intended and generating savings.
- ERA's Service Provider will take pictures of the retrofit installation and collect the data as detailed in the M&VR document, to verify the energy savings and GHG reductions achieved via the capital retrofit.

[2] To be eligible to receive the incentive, your retrofit should be deemed in-service by March 31, 2027.

- Submit the documentation provided by the reviewer to the portal.
- Once ERA's Service Provider successfully reviews the documentation, you will get an automated e-mail notifying that your retrofit has been deemed in-service.
- Depending upon the nature of the retrofit, ERA's Service Provider will request the retrofit operating data as outlined in the M&VR document.
  - For stable systems with minimal seasonal variation (e.g. a variable frequency drive on a motor), the data submitted for in-service verification will be sufficient. ERA's Service Provider will not request any additional data.
  - For systems with seasonal variance (e.g. chillers), ERA's Service Provider will wait for a complete seasonal cycle before requesting the M&VR data.
  - For systems with a variable performance, ERA's Service Provider will wait for an entire year before requesting the M&VR data.
- If applicable, provide a description of any events that may have impacted the retrofit's performance.
- ERA's Service Provider will review the data to determine the savings achieved by your retrofit. ERA's Service Provider may reach out to you to request any additional information required to complete the review.
- If the data analysis shows that the retrofit has been underperforming, ERA's Service Provider will request additional data to track the cause of underperformance and will suggest any remedial measures.

Tip: Your Eligible Contractor can submit post-activity deliverables on your behalf.

STEP 6: SUBMIT INVOICES AND RECEIVE INCENTIVE

1. Once ERA's Service Provider has determined that the retrofit is generating sufficient energy savings/GHG reduction (5% of the baseline), you will be required to submit the invoices for any eligible expenses.
2. List out all the eligible retrofit cost items the retrofit in a worksheet.
3. Submit the worksheet in the portal along with supporting contractor and vendor invoices, details on in-kind contributions including supporting documents, and incentive invoice.
4. You will receive an automated e-mail upon successful submission of the invoices and completed worksheet.
5. Once ERA's Service Provider has reviewed the invoices, you will get an automated e-mail to provide your banking details.
6. Provide your banking details including a copy of void cheque. You will be notified confirming the successful submission.
7. ERA's Service Provider will review your payment request. If the payment details you entered matches the information on your void cheque, payment will be processed within four weeks. You can track the progress of your payment by visiting the portal.

Once the Retrofit savings have been verified and supporting documentation have been reviewed and approved, the Capital Retrofits incentive will be issued (up to $1,000,000 for each facility). Payment will be issued via electronic funds transfer.

Tip: Your Eligible Contractor can submit required information on your behalf.

ELIGIBLE ACTIVITES & INCENTIVES