STRATEGIC ENERGY MANAGEMENT FOR INDUSTRY

Strategic Energy Management (SEM) Application Guide

October 1, 2024

EMISSIONS REDUCTION ALBERTA
Natural Resources Canada
Ressources naturelles Canada
Alberta

STRATEGIC ENERGY MANAGEMENT FOR INDUSTRY

The purpose of the Strategic Energy Management (SEM) Application Guide ("Guide") is to provide you with step-by-step guidance on how to participate in the SEM activity of 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 SEM Activity including the registration process

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

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SEMI Program Overview

Emissions Reduction Alberta's Strategic Energy Management for Industry program (SEMI) helps industrial and manufacturing facilities improve their energy performance by offering co-funding 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** of 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. COMPREHENSIVE ENERGY STUDIES

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 (CFD) Studies**: CFD studies 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**: This approach focuses on optimizing the interactions between different processes to reduce energy consumption. Process integration studies 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. SEMI 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 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, Comprehensive Energy Studies, 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.

Strategic Energy Management (SEM) Overview

SEM is a structured process to improve an organization's energy performance through assessment, prioritization, and implementation of practices, processes, and policies that generate sustainable energy savings.

The SEM activity uses a group training structure facilitated by a qualified energy practitioner through training, coaching, peer-to-peer knowledge sharing, and technical support. The facilitated SEM process is a guided discovery and multi-level assessment through the components of SEM including:

- Develop facility specific energy use, key performance indicators, energy baseline, benchmarks, and metrics, and quantification of controllable and uncontrollable energy use
- Develop energy management goals and targets relative to the importance of energy use in your facilities operations
- Assess current energy management resources and ability to add resources to reach your goals and targets
- Establish a monitoring, reporting and communication framework aligned with your organization's information flows
- Prepare an action plan to improve areas of focus integrating operations, maintenance, capital planning, and other departments
- Discover methods of continual improvement, various energy management standards, and how to incorporate into your organization
- Learn through peer activities such as group discussion and case studies within your energy management training group

ERA's SEM is designed to accommodate varying levels of technical expertise and available resources, helping you gain a deeper understanding of your energy consumption. As you enhance your energy management skills and sophistication, you improve your ability to systematically and continually achieve energy savings.

To maximize your facility's gain from participation in SEM, ERA's Service Provider will develop an SEM plan including workshops, peer-to-peer meetings, and energy savings project implementation support. The SEM plan is required to be designed based on your needs from project focus to integration with ISO 50001 and continuous energy performance improvement. The SEM plan relies on the assessment conducted through the FRA as the primary source of information. Depending on your facility's current level of awareness and knowledge of energy management, the plan will outline expected short-term, mid-term, and long-term outcomes. Additionally, the plan will provide details about the cohort you will join for group discussions and workshops. The SEM plan also features a curriculum based on current energy management standards, tailored specifically to you and your facility's needs. Additional curriculum customization will emphasize using examples and case studies relevant to the participants in each group or cohort during the workshops. Each workshop will be accompanied by pre-reading material and an experiential learning activity to support the key components. Most of the key components of strategic energy management will be covered during in-person workshops.

SEM will be delivered using a variety of modalities to ensure participants attain their learning objectives. Depending on your specified cohort, participation in SEM will range between 12-24 months to accommodate the SEMI program cycle, and the pace requested by the group participants.

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:

- The facility is located in Alberta.
- The facility has been in operation for at least one year with fixed equipment and energy consumption information.
- You own or lease the facility. For a leased facility you have obtained permission from your landlord to undertake the key activities.

- The facility has completed a FRA, and one of its recommendations is participation in SEM. Note that if a FRA is not yet completed, but the facility is enrolled and on track to finish it, eligibility for SEM will be determined on a case-by-case basis upon the applicant's request.
- The facility belongs to one of the following North American Industry Classification System (NAICS) economic sectors:
  - **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
    - Postal Service
    - Couriers and Messengers
    - Warehousing and Storage
  - **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

SEM Registration Process

The SEM 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 SEM.

STEP 1
REGISTER IN SEMI PORTAL

STEP 2
CONFIRM SEM APPROACH
CONFIRM IN-KIND COMMITMENT
SIGN TERMS & CONDITIONS

STEP 3
COMPLETE WORKSHOPS AND PEER-TO-PEER MEETINGS
SUBMIT SEM REPORT

Further details on each step are provided below. For more details on the other eligible activities in SEMI, please visit the SEMI website.

STEP 1: REGISTER YOUR FACILITIES IN THE PORTAL

Register your facility in the Portal as you did for your FRA. You will select SEM registration for the facilities you wish to enrol in the Portal. Upon registration, you will receive an acknowledgment email confirming successful registration.

Tip: As part of the registration process, please ensure that your information, including contact email and facility details, is correct and up to date.

Your registration will be reviewed for program compliance by ERA's Service Provider. You will not be able to edit the registration information during the review process. If there are any questions or issues, a Program support team member will contact you.

STEP 2: CONFIRM SEM IN-KIND COMMITMENT, SIGN TERMS & CONDITIONS

ERA's SEM activity requires you to commit your time and other resources to successfully complete the SEM curriculum and attain the objectives of the activity. The SEM Terms and Conditions will include an overview of the curriculum to be delivered, expectations of your contribution, and an estimate of your in-kind commitment. You will be committing for the duration of the SEM activity.

Tip: The intent for SEMI is to have your in-kind contribution to be equal to the SEM budget. Therefore, we do not anticipate that you will need to provide a financial contribution to ensure your commitment to the SEM process. We will help you identify eligible in-kind contributions.

The SEM Terms and Conditions template is available on the Program website. Your SEM plan and in-kind commitment will be added to this template and sent back to you. Your facility will be enrolled upon receipt of the signed Terms and Conditions. An enrollment confirmation notice will be emailed to you. If we do not receive your signed SEM Terms and Conditions within 30 days, your SEM offer may be withdrawn due to budget constraints.

Tip: These documents are also accessible through the SEMI website and Portal for future reference.

STEP 3: COMPLETE SEM AND SUBMIT REPORT

The SEM plan, including the curriculum and duration, is finalized at Step 2. You are expected to participate for the full duration and complete all curriculum activities. The curriculum activities will include various requirements designed to meet the SEM objectives including development of case studies, employment engagement material, tip sheets, energy policy statements, among other items, various energy analysis models, update reports for your management, and a closing report and energy management plan for your facility.

Upon completing each curriculum activity, you will be required to submit an achievement report. This report should detail the energy savings projects implemented, verified energy and demand savings, and your in-kind contributions during the activity. At the conclusion of the SEM program, you will submit a final closing report. This report will serve as an executive summary of the previously submitted reports, highlighting the continuous energy improvement processes within your facility and outlining your plans for future SEMI activities, such as capital retrofits or EMIS upgrades. All SEM reporting requirements, including milestones and submission deadlines, will be provided in a comprehensive reporting guide by ERA's Service Provider.