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Beyond the next project:

What does world-class energy management look like?

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SAVE ON ENERGY POWER WHAT'S NEXT

Our Journey Today

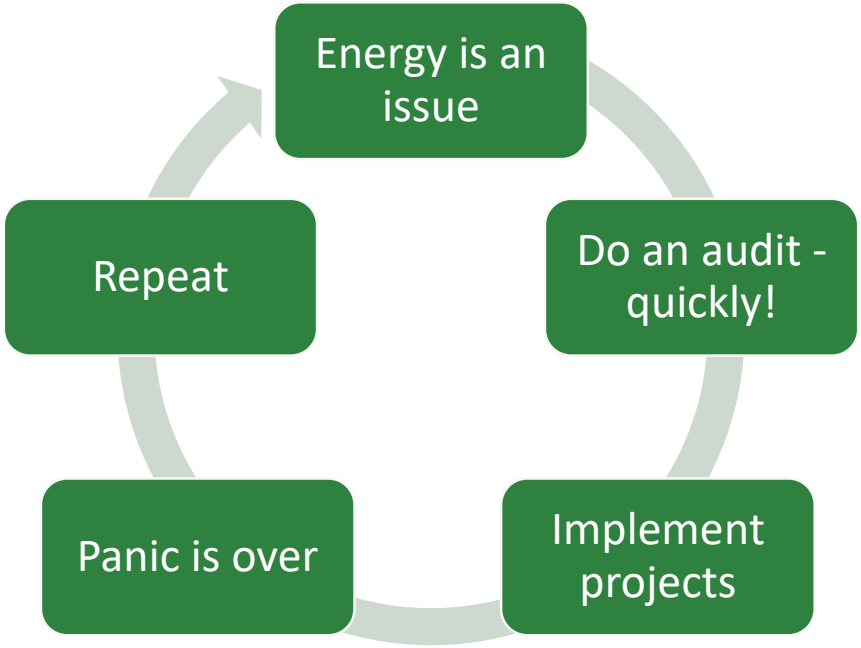
Strategic Energy Management – From delivering projects to managing energy

ISO 50001 – Certification of best practices in energy management

New Industrial Energy Efficiency Program – a primer

Strategic Energy Management (SEM)

Intervention Discussion – How to Break the Cycle



Simple Definition: Consortium for Energy Efficiency (CEE)

Industrial SEM

"Taking an **holistic** approach to managing energy use in order to **continuously improve** energy performance, by achieving persistent energy and cost savings over the **long term**. It focuses on **business practice change** from senior management through shop floor staff, **affecting organizational culture** to reduce energy waste and improve energy intensity. SEM emphasizes equipping and enabling plant management and staff to impact energy consumption through **behavioural and operational change**. While SEM does not emphasize a technical or project centric approach, SEM principles and objectives may support capital project implementation."

CEE SEM Minimum Elements

1. Customer commitment

2. Planning and implementation

3. System for measuring and reporting on energy performance

1. Customer Commitment

Commitment from the organization vital for SEM to succeed

a) Policy and goals

b) Resources

2. Planning and Implementation

a) Energy management assessment

b) Energy map

c) Metrics and goals

d) Project register

e) Employee engagement

f) Implementation

g) Reassessment

3. System for Measuring and Reporting on Energy Performance

a) Measurement

b) Data collection and availability

c) Analysis

d) Reporting

ISO 50001

What is EnMS (Energy Management System)?

An **energy management system** is a **framework** of **processes and procedures** used to ensure that an organization can **fulfill the tasks** required to achieve its objective of **efficient energy use**

Why a SYSTEM?

- Harness the power of the entire workforce
- Sustainable energy savings
- Operational and maintenance savings
- Energy becomes part of “the way we do business”

Why a STANDARD?

Tangible management commitment

- Weathers changing corporate priorities

Entrenched in corporate culture

- Not dependent on a “champion”
- Survives organizational changes

Embedded best practices

CSA ISO 50001:19

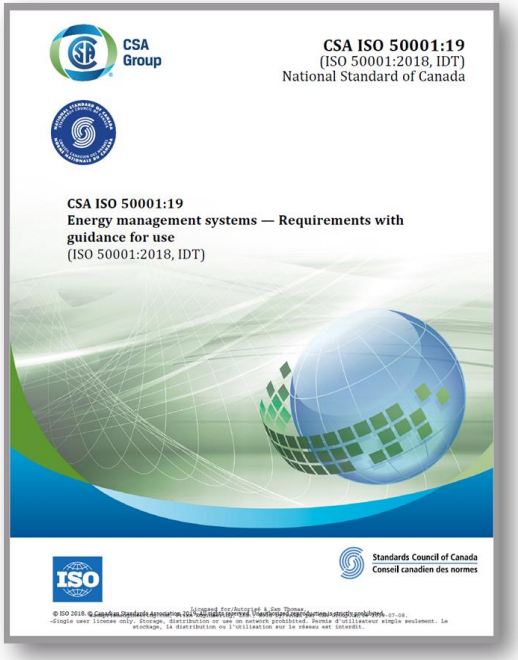
CAN/CSA - ISO 50001 is an international Energy Management Systems (EnMS) standard

First published in 2011, updated in 2018

Voluntary standard applicable to all types and sizes of organizations

Internationally recognized

Developed by the world's leading practitioners



Courtesy BC Hydro and Prism Engineering Ltd.

ISO 50001 in a nutshell

- A **voluntary** international **framework** for the effective and **sustainable management of energy** in any business
- Helps organizations **reduce energy use** through the utilization of **international best practices**
- Measurement and reporting disciplines, **continuous improvement** promote energy efficiency throughout the supply chain.
- Reduced energy leads to **reduced GHGs, lower operational costs**

What Makes ISO 50001 Special?

Performance based – not compliance based	• Real monetary savings • Can sell return on investment
Flexible for small, medium enterprises	• Not prescriptive • Whatever works for you (as long as it works!)
"Documentation" light	• "Controlled" documents limited • Components can be "documented" appropriately

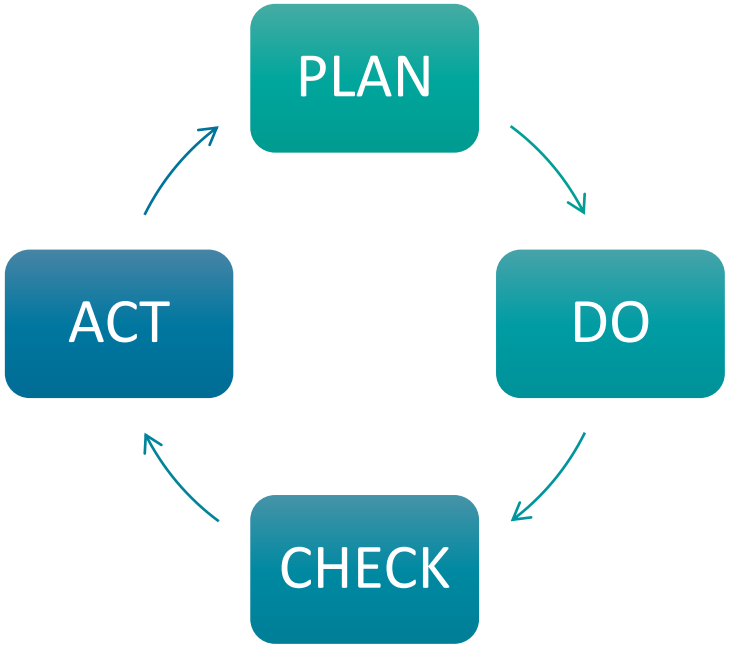
ISO 50001 – What It Will Do

- ✓ Assist in making **better use** of existing energy using assets
- ✓ Create **transparency** and facilitate **communication** on the management of energy resources
- ✓ Assist facilities in **evaluating and prioritizing** the implementation of **new energy-efficient** technologies
- ✓ Facilitate energy management improvements for **GHG reduction** projects
- ✓ Enable **integration** with other organizational **management systems**
- ✓ Make management of energy performance an **intrinsic part of the culture** of the organization

ISO 50001 – What it is NOT

- Not **prescriptive**
- Not an **energy management plan**
- Does not provide a process for **technical assessment** of plant systems or procedures
- Does not reflect **specific regulatory** requirements

The “Plan – Do – Check – Act” Approach



ISO 50001 requires an organization to: PLAN

- Understand the **context** of the organization
- Establish an **energy policy** and an **energy team**
- Conduct an **energy review**
- Establish **energy baselines** and **energy performance indicators**
- Establish **energy objectives and targets** that are measurable with timelines
- Establish an **action plan** to achieve energy objectives and targets

Courtesy BC Hydro and Prism Engineering Ltd.

Sample ISO 50001 Language

5.2 Energy policy

Top management shall establish an energy policy that:

a) is appropriate to the purpose of the organization;

b) provides a framework for setting and reviewing objectives and energy targets (see 6.2);

c) includes a commitment to ensure the availability of information and necessary resources to achieve objectives and energy targets;

d) includes a commitment to satisfy applicable legal requirements and other requirements (see 4.2) related to energy efficiency, energy use and energy consumption;

e) includes a commitment to continual improvement (see 10.2) of energy performance and the EnMS;

ISO 50001 requires an organization to: DO

- **Implement** the action plans
- Implement operational and maintenance **control**
- Conduct **training, communication and awareness** activities
- Ensure **energy competence** of all staff
- Establish **documentation** procedures (control of records)
- Include energy efficiency into new **design**
- Consider energy efficiency in **procurement** of energy, products & equipment

Courtesy BC Hydro and Prism Engineering Ltd.

Sample ISO 50001 Language

7.3 Awareness

Persons doing work under the organization's control shall be aware of:

a) the energy policy (see 5.2);

b) their contribution to the effectiveness of the EnMS, including achievement of objectives and energy targets (see 6.2), and the benefits of improved energy performance;

c) the impact of their activities or behaviour with respect to energy performance;

d) the implications of not conforming with the EnMS requirements.

ISO 50001 requires an organization to: CHECK

- ☑ **Monitoring, Measurement and Analysis**
- ☑ Evaluation of **compliance** with legal requirements
- ☑ **Internal audit** of EnMS
- ☑ **Control of Records**

Courtesy BC Hydro and Prism Engineering Ltd.

Sample ISO 50001 Language

6.4 Energy performance indicators

The organization shall determine EnPIs that:

a) are appropriate for measuring and monitoring its energy performance;

b) enable the organization to demonstrate energy performance improvement.

ISO 50001 requires an organization to: ACT

- Take action to address non-conformities and continually improve energy performance and the EnMS
- ISO 50001 Continual Improvement

10.2 Continual improvement

The organization shall continually improve the suitability, adequacy and effectiveness of the EnMS. The organization shall demonstrate continual energy performance improvement.

Courtesy BC Hydro and Prism Engineering Ltd.

This Really Works! Here's a Case Study

Facility	Electricity Improvements	Natural Gas Improvements
Plant 1	6.5%	28.5%
Plant 2	3%	5.5%
Plant 3	16.5%	24%
Plant 4	9.1%	0.9%
Plant 5	0.8%	-4.6%

gas intensity improved >20%

electricity intensity improved >15%

Additional retrofits to improve electricity intensity >25%

Newgold Inc. New Afton Mine

- First mine in North America to be certified to ISO 50001
- Energy performance improvements also resulted in operational, safety, environmental or maintenance benefits
- Increased energy awareness at all levels – important as it is people, not systems, who manage energy

"We see an excellent correlation between our ISO 50001 certification and results in terms of cost savings, efficiency improvement and environmental responsibility." — Oscar Flores, General Manager, New Afton Mine

Industry	Mining
Location	Kamloops, BC, Canada
Energy Management System	ISO 50001
Product/Service	Gold/Copper
Energy Performance Improvement (%)	11.4%
Annual energy cost savings (Canadian Dollars)	2014 – $643,000 2015 – $444,000
Cost to implement (including utility rebate incentives) (Canadian Dollars)	2014 – $690,000 2015 – $259,000
Payback period (years)	2014 – 1.1 2015 – 0.6

Key ISO 50001 "Family"

Published

- 50002 Energy Audit
- 50003 EnMS Certification
- 50004 EnMS Implementation
- 50006 EnB and EnPI
- 50005 Phased Approach
- 50007 Energy Services
- 50015 M&V
- 50046 Energy Savings Reporting
- 50047 Organizational Energy Savings

In Development

- 50009 Multiple Organizations
- 50010 Zero Net Energy
- 500xx Implementation Levels
- 50044 Energy Savings Projects (TS)
- 50049 Regional Energy Savings

Industrial Energy Efficiency Program (IEEP)

IEEP - Description

- The IESO's 2021-2024 Conservation and Demand Management Program Plan includes the launch of a new customer focused program in 2022 – an industrial call for proposals
- Provides overall total funding of nearly $80 million over **two competitive rounds** of funding in 2022 and 2023
- Launched in April 2022, IEEP offers large industrial customers up to $5 million for each energy-efficiency project accepted into the program
- IEEP offers greater flexibility and streamlined administration compared to the former Industrial Accelerator/Process and Systems Upgrade Programs

IEEP - Eligibility

Participants and Facilities

- Non-residential customers with ownership of, or operational authority over, industrial facilities in which projects are implemented; or
- Third-parties who have authority to install and operate projects at facilities on behalf of the owners or operators of the facilities
- Facilities must be connected to, or behind the meter of another electricity consumer connected, either directly or indirectly, to the IESO controlled-grid or a distribution system

IEEP - Eligibility (2)

Electricity-Saving Measures

- Must be applied to, or support, an industrial process and result in measureable and enduring electricity savings
- Industrial process means the "extraction, growth, refinement, process, production, manufacture, or preparation of materials"
- Proposed technologies should be commercially available according to ISC Technology Readiness Level (TRL) 9, defined by Innovation, Science and Economic Development Canada as "actual technology proven through successful deployment in an operational setting"

IEEP - Eligibility (3)

Projects

- Projects must include measures that deliver a minimum electricity savings of 2,000 MWh, which must also result in a minimum 15% reduction of the electrical energy use within the project boundary defined by the applicant
- Projects may include multiple sub-projects, including sub-projects implemented at multiple facilities, where the overall project is bound by the minimum savings requirements described above
- Sub-projects must each produce a minimum savings of 500 MWh

IEEP - Application Process

- **Stage 1 Application**
  - Opened April 11, 2022
  - Stage 1 includes project registration and preliminary eligibility screening
  - Basic applicant, facility and project details required in Stage 1
  - The IESO to confirm* eligibility before inviting applicants to submit Stage 2 applications

**Stage 1 application confirmation does not guarantee incentive funding*

IEEP - Application Process (2)

- **Stage 2 Application**
  - Window opens September 1, 2022
  - Stage 2 requires a detailed project proposal
  - You can find a Stage 2 application template on the Save on Energy IEEP page
  - Stage 2 proposals to be competitively evaluated by a third-party technical reviewer
  - The IESO will offer successful Stage 2 applicants the opportunity to enter into participant agreement within a prescribed timeline

Measurement and Verification (M&V) Plan

- Applicants must submit an M&V plan for their project(s) describing how the electricity savings will be measured
- The M&V plan must adhere to the International Performance Measurement and Verification Protocol - EVO 10000-1: 2016 (or later)
- The plan will require baseline measurements before the project is implemented
- The M&V plan must be approved by the IESO and will form part of the participant agreement

IEEP Incentives

- The applicant will propose the incentive amount needed to implement the project, and will be expected to demonstrate the amount is necessary to meet internal financial requirements
- The maximum incentive per project is $5 million
- The incentive is capped at 75% of final eligible project costs, after subtracting any third-party contributions

Competitive Evaluation of Proposals

- Projects will be ranked for consideration for funding based on the following categories:
  - Project proposal (35 points)
  - Proposed savings (25 points)
  - Ratepayer investment (40 points)
  - For more information, visit the Save on Energy IEEP page.

About the IESO

About the IESO

- Reliably operates Ontario's Province-wide system 24/7
- Plans for Ontario's future energy needs
- Enables competition and creates efficient electricity markets
- Enables province-wide energy efficiency
- Purposefully engages to enable informed decisions
- Supports innovation
- Cybersecurity leadership
- Smart Metering Entity

Energy Efficiency in Ontario

Energy efficiency makes a lasting contribution toward reducing long-term energy costs

- When planning for Ontario's long-term electricity needs, the IESO forecasts, and counts on, the extent to which energy-efficiency initiatives will reduce those needs
- Ontario has saved 16 terawatt-hours (TWh) of electricity as a result of CDM Programs since 2011 – equivalent to powering a city the size of Ottawa for more than two years.

Questions?

Stay in the know

Sign up for the Save on Energy Business newsletter