



## Case study for New Gold New Afton Mine ISO 50001

New Gold is a leading international gold producer. When the company hired a BC Hydro-funded Industrial Energy Manager in 2011 and officially opened New Afton mine 15 km west of Kamloops, B.C. in 2012, it was an opportunity to capitalize on the foundational support provided by BC Hydro to pursue the first ISO 50001 certification at a mine in North America.

BC Hydro's Strategic Energy Management (SEM) Program enables organizations to successfully staff and deliver a strategic approach to managing energy. ISO 50001 takes energy management to the next level with an external validation process, a focus on operations and controls and the requirement to understand and document all energy management systems.

### THIS CASE STUDY:

- explores the value of ISO 50001 to BC companies
- compares the certification process to BC Hydro's SEM Program
- outlines the steps to implementation and shares results, benefits and lessons learned based on New Afton mine's experience

### BRIEF OVERVIEW OF ISO 50001

Many organizations have made great strides in reducing energy consumption, but they are now asking themselves whether their project-based approach to energy savings will reach their goals. Often, the answer is to introduce a systematic approach to managing energy, also known as an Energy Management System. Taking a management systems approach and establishing sound business processes are necessary for achieving continual improvement in many aspects of an organization. Energy is no different.

In summer 2011, the International Standards Organization released the ISO 50001 Energy Management System Standard which formalises energy management and provides a global benchmark. This standard has been adopted by the Canadian Industry Program for Energy Conservation amongst other national organisations.

Unless indicated otherwise, all quotes in this case study are attributed to Andrew Cooper.

# Why ISO 50001 for New Gold's New Afton Mine?

## MAKING THE BUSINESS CASE TO PURSUE ISO 50001

With gold prices dropping from \$1,900 per ounce in 2011 to under \$1,200 in 2015, cost reductions in production and operations are critical in the mining business. To maintain competitiveness, producers must find improvements that require minimal capital investment through innovation, creativity, and improved systems.



“Mining is energy intensive,” says Andrew Cooper, New Afton’s Energy Specialist. “At the New Afton Mine, a one per cent reduction in energy costs is worth hundreds of thousands of dollars a year. With low commodity prices and increasing offshore competition, energy–efficiency improvement is one of the few places where we find increases in profitability.” ISO certification offers value to the company in several ways. It helps achieve the consistent cost reductions the company requires to remain competitive. From a social responsibility perspective, ISO fits well with New Gold’s corporate social responsibility program as well as the company’s Towards Sustainability Mining initiatives. Furthermore, ISO 50001 provides a vehicle to achieve the company’s Energy Management vision: to have energy management practiced by all employees on a day–to–day basis.

A key element of the value ISO delivered to New Afton stemmed from the accountability that it created. Internally, having an outside organization verify the site’s energy management system meant the entire team had to sit down and work with an auditor to assess their organization. Externally, it offered value through recognition and verification of the site’s commitment to social responsibility and sustainable mining.

Says Cooper, “ISO certification means a few things: it’s verification that we are serious about managing energy; it’s in line with our vision around energy management and our values at the mine; and in addition to assisting with cost reduction and GHG reduction, it also demonstrates a commitment to social responsibility and sustainable mining.”

## CONNECTING ISO TO OTHER CORPORATE PRIORITIES

Energy–efficiency projects often result in operational performance improvements. At New Afton, every energy–efficiency project completed has had additional benefits for operations (production), safety and the environment. Increasing efficiency with process improvements on an ongoing basis is part of the culture of the company, so energy efficiency connects well to this focus.

“I’m always very conscientious of the fact that the primary objective of the mine is to produce copper and gold concentrate,” says Cooper. “If something’s just going to save energy and not help with production, people are going to lose interest. For example, we did a flotation blower improvement project, where we saved a lot of energy. At the same time, we improved the operation of the circuit that increased production, the air flow to the flotation process is smoother, and since the operators don’t have to run around and adjust valves, there’s a safety improvement. On top of that, we were able to reduce the noise of the equipment, another health and safety benefit.”





## Company Overview

- New Gold is a leading intermediate-size gold producer. Their New Afton operation was originally designed to process 11,000 tons per day (4 million tons per annum) of ore at full capacity, recovering copper, gold and silver.
- Commercial production started in July 2012 at New Afton, 15 km west of Kamloops, B.C. Processing includes conventional crushing, grinding, and concentration processes, with mineral separation by gravity concentration and differential flotation.
- Annual production at New Afton in 2014 was 104,589 ounces of gold, 200,000 ounces of silver and 84.5 million pounds of copper.
- A BC Hydro funded energy manager has been in place since October 2011.
- The Strategic Energy Management (SEM) approach was in place at the site when certification was pursued.
- New Afton is the first mine in North America to achieve ISO 50001 certification.

## Comparing BC Hydro’s SEM Program to ISO 50001

BC Hydro’s SEM Program and ISO 50001 complement each other, with both integrating energy management into management practices. ISO then ensures these are sustained through regular external validation. Based on New Afton Mine’s experience the two energy management programs compare in the following ways.

FEATURES	BC HYDRO’S SEM PROGRAM	ISO 50001
Requirements	Flexible	Prescriptive
Focus	Identify and implement energy projects within a comprehensive energy management framework.	Understand energy use for Significant Energy Uses (SEU).
Results	Expected energy savings for each two-year contract.	Energy performance is measured against Energy Performance Indicators (energy objectives and targets determined by the organization).
Reporting	Quarterly update reporting to BC Hydro.	Annual reporting with third party verification.
Validation	Energy savings verified through measurement and verification of capital projects. Self-reporting of other SEM activities.	External audits of processes and procedures as well as methods for determining Energy Performance Indicators and measurement and verification.
Certification	Not provided	Provided
Funding	Financial support by BC Hydro for program initiatives, including the Industrial Energy Manager role, Energy Coaching and Employee Engagement support.	Co-funding available from NRCan to support ISO certification (was \$25,000 for New Gold, additional funding now available). BC Hydro funding support for some initiatives related to ISO.
Incentives	Provides access to funding opportunities for studies and incentives for retrofit projects.	No funding provided for projects.
Other	Strong support from BC Hydro account management, engineering and marketing departments. Energy Management Assessment and Audits supported by BC Hydro were aligned with ISO requirements.	No direct support for ISO 50001.
What’s not included	Different focus compared to ISO 50001 on operational controls and how to manage them.	No external reporting during the year.  The annual Energy Review takes the place of a bi-annual Energy Management Assessment.

“The BC Hydro program is second to none; there are not many utilities that offer the support it offers,” says Cooper. “ISO 50001 may not have been possible without the energy project funding and coaching support from BC Hydro that enabled it to happen.”

## Getting to ISO 50001: the Implementation Phase

### PRIOR TO ISO IMPLEMENTATION

Since the launch of its energy management program, New Afton has built from the ground up, a different approach than that taken in some companies where the mandate for energy efficiency starts at a high level and is pushed down through the organization. By starting with the operators on the floor and getting proof of concept, Cooper has been able to use initial energy project success stories to secure support from the executive team to pursue ISO 50001 certification.

## **IMPLEMENTING ISO**

New Afton followed five steps, many of which were in place from their SEM Program participation, to achieve ISO 50001 certification:

1. Building on previous energy management success, gained support from senior management for certification.
2. Measured energy performance:
  - o Energy Management Information System (EMIS): workshop, system design, vendor selection, set up;
  - o Process Integration (PI): server installed and data stored in database;
  - o EAC: Identified Energy Account Centres: Milling (5), Mining (5), Crushing and Conveying.
3. Developed an energy policy that calls for staff commitment to continually improve energy performance.
4. Developed and implemented training and engagement plans: “When you have a 24/7 operation with different departments and different crews, the energy team has to spend a lot of time spreading the word, training people and promoting the program.”
5. Prepared documentation: prepared for the auditor; not just program components but proof of what is being done as well.

## **CHALLENGES TO IMPLEMENTATION**

The biggest challenge for New Afton lay in operational controls and maintenance, and getting people to remember what is expected of them from an energy management perspective. To tackle the challenge, Cooper has spent countless hours talking to crews. He has daily conversations with people who want to talk about energy; this aspect of the work is constant and ongoing.

“All the interaction with the crew is important because it’s people, not systems, that manage energy,” he says. “This is how I communicate specifics of SEUs [Specific Energy Uses], the operational requirements of their department relating to energy management and how operators get to know exactly what they need to do to operate with optimal efficiency. They are not going to know that unless you get in front of them.”

With more than 152 electrical sub-meters and five gas sub-meters, another challenge to implementing ISO was the time required to install sub-metering and ensure that each meter was communicating properly with the Energy Management Information System (EMIS).

## **BUILDING ON ISO 14001**

New Afton is certified to the environmental standard ISO 14001. However, as they entered the ISO 50001 certification process, Cooper and his Energy Team were surprised to find there isn’t as much overlap as they anticipated. ISO 50001 addresses a key energy management section in the 14001 system, but the most similar aspect between the two standards is the document management and control system. That being said, Cooper points out that, “it made an easier case for 50001 because people were already using ISO, so it wasn’t a new thing we were trying to implement.”



## INCREMENTAL VALUE PROPOSITION FOR ISO CERTIFICATION (BEYOND SEM)

The external accountability aspect of ISO 50001 helped build energy management into the New Afton's systems and the culture of the company. Energy is a topic discussed during daily staff huddles and Cooper was given a platform at the mine's quarterly meetings and in the site newsletter.

To maintain certification, the company also includes energy performance improvement objectives in the organization's business planning process and uses a systematic approach to consider energy efficiency in new design or upgrades.

"[With ISO 50001] everything's covered, even down to the operational aspects of managing energy. You have to identify each Significant Energy Use (SEU), develop training programs for each SEU, do operator training on specifics of energy within each SEU, develop significant deviations and targets for each SEU and tell people how they need to act in case of significant deviations for each SEU."

## Results and Benefits

### RESULTS FROM THE ISO CERTIFICATION PROCESS



With a strong Strategic Energy Management Program in place, New Afton Mine used the ISO 50001 certification process to reinforce good energy management practices and achieve a number of impressive results:

- ISO certification in March 2014.
- Energy performance improvement initiatives implemented in 2014 yielded savings equivalent to 7.3% of 2013's total energy consumption.
- The New Afton operation was originally designed to process 11,000 tons per day (4 million tons per annum) of ore at full capacity. With the focus on energy efficiency and process improvements, the mine has increased production to more than 5 million tons per annum – 25% above design.
- Projects completed in 2014 include:
  - Conveyor shut down during shift changes identified by staff.
  - Mill flotation blower control upgrade.
  - Underground compressed air compressor relocation.
  - Increase in the port size of SAG mill discharge grate.
  - Surface and mill lighting upgrades.
- As a result of its hard work, New Afton mine was awarded NRCan's CIPEC Leadership Award for Energy Performance Management in May 2014.

## KEY BENEFITS

The benefits of participating in the ISO certification process and having a strong Strategic Energy Management Program in place have been numerous for New Afton.

- The mandated regular management reviews of energy ensure that energy management remains a focus with senior management at the mine.
- By participating in the process, New Afton has built a strong energy team with representatives from across the mine.
- Engagement of operators and staff across the site has improved. Staff are more aware of energy management opportunities and their role in achieving results.
- Energy performance improvement projects have resulted in a number of spinoff health and safety benefits.
- Energy data is used instead of run hours for some reliability-centred maintenance. Energy data shows how hard equipment is working as opposed to how long it is running for.
- The annual checks conducted by a third party provide rigour to the program as well as validation that “we are doing the right things.” They are also an opportunity for the mine to reinforce and renew their commitment by maintaining their certification.
- ISO 50001 ensures that “you can’t let up on energy management: ISO requires you to stay on top of all aspects of the program and continually improve. And that’s a good thing.”

## Lessons Learned

CHALLENGE	LESSONS LEARNED
You have to sell the benefits of the system	<ul style="list-style-type: none"> <li>• For Cooper and his team, it took plenty of internal selling to implement ISO 50001. This required face-to-face interactions, talking to people and listening to their concerns.</li> <li>• The conversations involved letting different people know what ISO would do for them, how it would make their job easier, how it would improve profitability and enhance company image.</li> </ul>
Look beyond energy savings	<ul style="list-style-type: none"> <li>• Most energy-efficiency projects also have operational, environmental and safety benefits.</li> </ul>
Time commitment	<ul style="list-style-type: none"> <li>• Additional time is required to complete the certification process, beyond what is expected for SEM. This is especially true when considering the time it took to get communications established for the metering and Energy Management Information System (EMIS).</li> </ul>
Metering	<ul style="list-style-type: none"> <li>• Having or installing a good metering system is critical. Meters, relays and transmitters used for managing or monitoring energy performance need to be calibrated, and it is important to have a system to ensure these items remain accurate.</li> </ul>
The need for outside assistance	<ul style="list-style-type: none"> <li>• Accomplishing ISO 50001 would be a challenging to do without support. Energy Managers are well positioned to seek support from BC Hydro and Natural Resources Canada’s ecoENERGY Efficiency for Industry program.</li> </ul>

## HOW CAN ISO 50001 HELP OTHER BC HYDRO INDUSTRIAL SEM PARTICIPANTS ACHIEVE THEIR ENERGY MANAGEMENT GOALS?

New Afton took the first step with SEM, providing a strong foundation for success in energy management. Going beyond SEM to 50001 provided additional benefits. These included the additional traction gained through an external verification process, the greater structure and systems required to achieve certification and the focus on detail in the energy management program.

Says Cooper, “You’ve got to have a vision and it has to be inspiring, even if it’s only for the person managing the project. It’s got to say what you want to achieve, where you want to get to, what it’s going to do for you and what is the long term goal? As part of our SEM Program, we put ours together into a policy and in a lot of ways it’s become what we do now. The vision is still relevant today. I saw ISO 50001 as a vehicle to achieve our vision.”

### Looking to the Future

New Afton will continue to promote energy management as a core activity. They will use the EMIS to make energy management visible to all levels of the organization and to optimize energy use. A key area for improvement is to solidify the ISO 50001 systems, ensuring energy management is integrated into everyone’s work process, not dependent on a single person or department.

Finally, the success of the energy management program at New Afton will help to bring the experience to other New Gold facilities.