

Goldcorp Red Lake Mine

Ramping up to corporate-wide energy management with Dollars to \$ense Energy Management workshops

Natural Resources Canada's (NRCan) Dollars to \$ense energy management workshop series helps companies become more energy-efficient. By learning from the workshops, organizations can reduce their greenhouse gas emissions, lower their operating and production costs, create better work environments and increase their operational efficiency. Natural Resource Canada is pleased to announce that the Canadian Institute for Energy Training (CIET) is the sole licensee of the Dollars to \$ense energy management workshops in Canada. For information on booking a Dollars to \$ense energy management workshop please contact CIET by phone at 1 800 461-7618, by email at info@cietcanada.com or, website: cietcanada.com.

For many years, energy champions at Goldcorp Inc.'s Red Lake Mine in northern Ontario have implemented energy efficiency projects, doing their part to bring about a more energy-conscious corporate culture. In 2014, the company took a significant step by asking NRCan to customize the Dollars to \$ense workshop series so that Red Lake Mine could develop a full-fledged energy management plan and make sustainable, company-wide energy efficiency improvements.

The exercise was highly successful. The staff at Red Lake Mine put in a week of intensive work and many other smaller efforts to improve how they manage energy. They gained a deeper understanding of the key software and other tools needed to implement a sustainable energy management plan and worked toward compliance with ISO 50001, the Energy Management Systems standard.

Photo: Red Lake Mine site

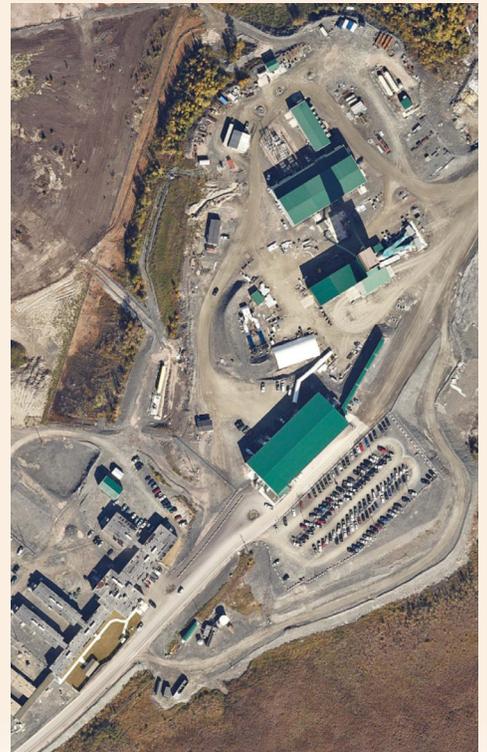


CASE STUDY SNAPSHOT

Red Lake Mine saved about 13,000 MW of energy in 2015.

Reducing the use of large fans in the mine by 30 percent, saved almost 4 MW of electricity.

A new compressed air leak demand program ended losses of \$1 million annually.



Aerial view of the Red Lake Mine site

Canada

Corporate profile

Located in one of the world's most prolific gold districts of the Canadian Shield, Red Lake Mine is among Goldcorp's top producing gold mines. Recent investments in infrastructure and development have positioned this mine for many more years of long-term, sustainable production.

In recent years, innovative techniques have improved efficiency and environmental responsibility. Among the improvements are a series of management programs for environmental activities and tailings management. In 2010, Red Lake Mine was certified under the *International Cyanide Management Code For the Manufacture, Transport, and Use of Cyanide In the Production of Gold*, the international benchmark for transporting, storing and using cyanide.

Red Lake Mine employs about 1,100 people at three complexes: Balmer Complex, Red Lake Complex and Campbell Complex.

Genesis of a workshop series

In 2014, Red Lake Mine looked to NRCan's Dollars to \$ense Energy Management workshop series to improve its energy efficiency planning and implementation. The aim was to better understand the energy savings opportunities available to mining operations and how best to move toward building a framework for long-term success.

Energy Manager Matthew Curtis was particularly looking for inspiration and assistance in creating an energy management plan. He wanted to formalize an energy management framework at Red Lake Mine by setting up a series of energy cost centres (ECC) and identifying the specific data the company would need to build toward ISO 50001 compliance. More importantly, Curtis was looking for energy efficiency

tools that would help management encourage a culture of energy efficiency across the company.

"We wanted some guidance on how to think outside the box," he says. "For example, how do you change the culture in your organization so that a leaking air pipe that has been wasting energy for years will be identified as an unacceptable standard? We wanted to implement substantial change."

"We wanted some guidance on how to think outside the box and implement substantial change."

Custom workshops to suit the company and industry

The company's first Dollars to \$ense workshop took place at Goldcorp's Musselwhite site. The company undertook the workshop at the corporate level and included energy managers from Red Lake Mine, Porcupine Gold Mines, Musselwhite Mine and Goldcorp's Vancouver offices. This introductory session examined how to assemble an energy management team and build a strategic framework for energy management. It also showed how to identify savings opportunities. The Musselwhite session was intensive and lasted a full week. It provided a great deal of learning for the Red Lake Mine attendees and served as a jumping-off point for other types of learning.

"We looked into the benefits and logistics of energy audits and ECC and realized how much there was to learn," says Curtis. Curtis and his team also realized the importance of customizing Dollars to \$ense workshops because they are not optimally suited to the mining sector, which is more process-based than many other industrial sectors.



Scoop tram

Spreading the learning across all mine sites

Because the energy champions and energy leaders from all the Red Lake Mine complexes attended the initial plus three subsequent workshops, Curtis reasoned that they were the best people to spread lessons to their respective energy teams.

“The workshops evolved as we explored new topics,” says Curtis. For example, during the initial corporate workshop, demonstrations on the software technology available to mining operations convinced the Red Lake Mine team that they needed a dedicated workshop on energy software. That led to an interest in energy metering, including more training about ECC and auditing methods.

Value of RETScreen

Initially, Red Lake Mine staff had a particular interest in becoming more familiar with RETScreen® and in surveying ongoing energy performance analysis. RETScreen is a software system for clean energy management developed by NRCan’s CanmetENERGY. Companies use it to analyze the feasibility of renewable energy and cogeneration projects. One particular advantage of RETScreen for Red Lake Mine is the ability to gather data for creating baselines for energy and fuel use, which helps with forecasting future use. “It also lets you find similarities in your processes,” says Curtis. “There is a lot of useful functionality we can use. We make it a priority to get the most we can out of RETScreen technology.”

Energy metering technology

Another workshop held at the Red Lake Mine main office at the Balmer Complex helped the company create and optimize its energy metering technology. As part of this exercise, the energy team learned to separate metering into ECC. Each cost centre is responsible for energy efficiency within a specific operational segment of the business, such as rock grinding in the company’s mill. By establishing ECC, Red Lake Mine can examine its performance on the process level. An additional benefit is that the person running each cost centre can take responsibility for the energy efficiency performance of that process. “The idea is to track our energy use right down to the individual motor,” says Curtis.

Keys to success

- A key element for success is a good energy management team. A common misconception is that once an energy manager is hired, energy efficiency will flow naturally.
- A special budget must be set aside for energy efficiency improvements. Without it, says Curtis, “You’ll fight tooth and nail to fund every project.”
- It helps to get support from the leader in any department that has a stake in energy management, such as maintenance, milling and mining. Once leaders buy in, they can be their own departments’ energy managers and focus on their unique priorities – one energy champion cannot be the expert in everything.

Selling the business plan to management

Red Lake Mine has several energy efficiency projects either completed or planned following what was learned through Dollars to \$ense energy management workshops.

One new project is the compressed air leak demand program. **Red Lake Mine discovered that it was wasting close to \$1 million per year due to the inefficient use of compressors.** The company audited the compressor system and presented a business case for making upgrades to management. The business case was approved. “We found the problem during the workshop, and the whole idea to deal with it came from that.”

Another current project is auditing building envelopes. “Instead of doing just the ‘big money’ fixes, we are also looking at the small stuff, which, when you have more than 100 buildings, adds up,” says Curtis. The three complexes include several surface buildings. The company audited all of them for energy efficiency – looking at windows, door seals, weather stripping, etc. – and found several opportunities to reduce its propane and natural gas bills. It built a business case, which was easily sold to management.

“Instead of doing just the ‘big money’ fixes, we are also looking at the small stuff, which . . . adds up.”

Curtis said the biggest obstacle to getting energy projects approved is verifying the value of software and hardware purchases. This is important not only for selling management on the benefits, **but also for attracting government cost-sharing for energy efficiency upgrades.** “Especially when we are trying to attract government funding, we have to be transparent.” Curtis says that the new metering and RETScreen capabilities will aid in his team’s push toward a full-fledged energy management plan and, in 2016, toward ISO 50001 compliance.

Future plans

Curtis wants Red Lake Mine to look into making its ventilation system more energy-efficient. Not surprisingly, mines use extensive ventilation underground to ensure a healthy and safe work environment. However, the ventilation system has no mechanism for stopping auxiliary ventilation when workers are not present and when vent clearing is not required after an underground blast. “We are looking into how we can customize ECC for auxiliary ventilation.”

One piece of overarching functionality that Curtis would love to have is software that provides a cost centre dashboard at his worksite. That way, all workers could access data in real time and see whether energy use is rising or falling. For example, if energy begins to spike in a specific motor, maintenance could see that and fix it before the motor blows. “It means that everyone can become an energy manager so that I am not working alone toward these goals,” says Curtis. “There is so much you can do with this data if you use it properly.”

The most important lesson for energy management teams is to get buy in from management . . . Without management’s support, no project can succeed for long. This principle is taught in the Dollars to Sense energy management workshops.

Key challenges

At Red Lake Mine, getting management support took a lot of effort. The energy manager had to prove he had done his due diligence via an exhaustive measurement and verification plan. The plan demonstrated that energy efficiency was not just the “flavour of the month.”

Changing a company’s culture toward energy efficiency is another key challenge. But the payoffs are potentially enormous. At Red Lake Mine, many projects depend on workers cooperating and spotting opportunities for improvement. But for that to work, employees have to be acculturated to energy efficiency.

Important for piecing together the “culture puzzle” is to have energy leaders be seen by employees on a regular basis. This means getting out of the office as often as possible and participating in huddle meetings. “One of the biggest downfalls is if the workers do not know who you are or what you do,” says Curtis.



Underground mining loader

Key results

For 2015, Red Lake Mine has saved about 13,000 megawatts (MW) of energy. This included small projects such as fixing compressor leaks, which takes a tremendous load off the mine's massive air compressors. It also includes converting to natural gas to replace electric heating, saving 2 MW of energy.

The beginnings of the mine's ventilation reduction program has already reduced the use of the mine's large fans by 30 percent, saving almost 4 MW of energy. The Dollars to \$ense energy management workshops allowed Red Lake Mine to create the measurement and verification tools needed to accurately track and measure these initiatives.

For more information on the Dollars to \$ense energy management workshops, visit nrcan.gc.ca/energy/efficiency/industry/training-awareness/5489.

Lessons learned

- The most important lesson for energy management teams is to get buy in from management for energy management workshops and upgrade plans. Without management's support, no project can succeed for long. This principle is taught in the Dollars to \$ense energy management workshops.
- Getting employees to cooperate is also critical. Employee engagement works well through contests and rewards. Red Lake Mine rewards workers with anything from flashlights to fishing gear when they come up with ideas that help save energy. In addition, workers qualify for bonuses when they spot energy efficiency opportunities.

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