

# Global Energy Management System Implementation: Case Study

Canada

## Global Wood Concepts Ltd.

*Toronto furniture manufacturer first in Canada to earn ISO 50001 certification*



**HOLZMA grinder replacement:** The grinder's 30 hp motor was running 18 hours per day but used only 35 percent of the time. This new pneumatic guillotine replaced the grinder and operates only when needed. Estimated annual savings: 41,355 kWh or \$6,616.

### About CAN/CSA ISO 50001 Energy Management Systems standard certification

The ISO 50001 Energy Management Systems standard provides organizations with a structured framework to manage energy in such a way that it can increase energy efficiency, reduce costs and improve energy performance. This standard is based on the common elements found in all the ISO management systems standards, assuring a high level of compatibility with ISO 9001 (quality management) and ISO 14001 (environmental management). It integrates energy efficiency into management practices by making better use of existing energy-consuming processes. Based on



### Case Study Snapshot

<b>Industry</b>	Office Furniture Manufacturing
<b>Location</b>	Toronto, Ontario
<b>Energy Management System</b>	ISO 50001
<b>Key Driver for EnMS</b>	Energy Use Reduction
<b>Improvement Focus</b>	Energy efficiency for operations and production, the first furniture company in Canada to be certified
<b>Product/Service</b>	Office and Institutional Furniture
<b>2015 Expected Energy Savings</b>	93,147 kWh
<b>Employees</b>	150 to 200
<b>Energy Sources</b>	Electricity, natural gas, water
<b>2015 Energy Management Objective</b>	5 percent reduction in energy used per unit of product
<b>Payback period</b>	7 years

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the Plan-Do-Check-Act cycle, this standard integrates both technical and managerial activities.

ISO 50001 Certification Overview

For Global Wood Concepts Ltd. in Toronto, Ontario, becoming certified in the ISO 50001 Energy Management Systems standard in 2015 was the logical next step in the company’s evolution as an energy saver. By 2014, Global had many successful energy efficiency projects to its credit and had a firm foundation in becoming ISO certified (it had already achieved 9001 [quality management] and 14001 [environmental management] certification).

Meanwhile, Canada continued to lag behind most other countries for productivity in this sector, which motivated Global Wood Concepts to use ISO 50001 as one important way to remain competitive. The company’s energy reductions for 2014–2015 – the years in which it began to implement ISO 50001 – totaled 234,688 kilowatt-hours (kWh) or \$37,546 in financial savings.

Business Benefits Achieved

Since Global Wood Concepts began to build a formal EnMS as a decisive step toward ISO 50001 certification, the company has realized significant energy savings across several energy efficiency projects. Total energy reductions for 2014–2015 alone were 234,688 kWh or \$37,546 in savings. The following table lists projects the company undertook during that period.

*“Everyone from the production floor to the top needs to know what the plan is. It is partly a mental game. Everyone has to be energy conscious.”*

– Vladimir Rabinovitch, Project Manager, Manufacturing Engineer

Project	Estimated annual energy savings	
	(kWh)	(\$)
Cordless tools replace air drills for assembly operations	36,832	5,893
Label printing station upgraded with energy-efficient equipment	6,521	1,043
LED high ceiling lights	123,276	19,724
In-line air reducers	17,360	2,777
HOLZMA grinder replacement	41,355	6,616
LED outdoor lights	9,344	1,493
<b>Total</b>	<b>234,688</b>	<b>37,546</b>

Company (or Facility) Profile

Global Wood Concepts Ltd. is a Toronto company that designs and manufactures high-quality office furniture for standard and custom installations. Established in 1986, it is a subsidiary of The Global Group of companies and ships about 700 units per day to customers across Canada and the United States (U.S.).

With more than 150 employees, Global Wood Concepts sells through distribution channels rather than via retail sales. Typical clients are tenants of high-rise office buildings, provincial and federal governments, schools, universities, and prisons, which the company services through custom orders. Global Wood Concepts can fill orders within five working days from its 5,574 square metre facility. This swift service is a key competitive advantage over overseas furniture suppliers.

Business Case for Energy Management

The furniture manufacturing business is highly competitive, with the Canadian industry lagging behind the U.S. and many other countries in productivity. (According to Canadian Manufacturers and Exporters, Canada is ranked 13 among 20 industrial nations.) Part of the challenge is that Canadian furniture manufacturers consume far more energy than their international counterparts because other countries are

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using more advanced manufacturing technology that requires less energy to produce a unit of product.

For example, a Canadian operation such as Global Wood Concepts runs its cutting and edge banding department by using 50 employees over two shifts to produce 4,000 parts per day. A similar operation in Germany makes twice as many parts in the same period— but uses only 10 employees and two robots. Productivity is 10 times higher, and energy use is far less.

To become more competitive, Global Wood Concepts is continually looking for ways to increase efficiency and lower costs. Long before ISO 50001 became an option for this company, one goal was to use lean manufacturing as a systematic method for eliminating waste. The company made great progress between 2006 and 2012, at which time it began to work in a focused way toward ISO 50001 certification.

### Keys to Success

- For Global Wood Concepts, having a dedicated energy champion was essential. This person engaged in energy efficiency work from 2006 until the company achieved ISO 50001 certification in 2015. Therefore, continuity of work was key in this case.
- Also critical was senior management support for the work. Without buy in from the top, the energy champion could not have reached the milestone of becoming the first furniture manufacturer in Canada to achieve ISO 50001 certification.

### EnMS Development and Implementation

#### Driving a culture change toward ISO 50001

The company's story of ISO 50001 certification is one of a gradual culture change and steady success. The journey began in 2006, when the company took its first steps toward managing waste and energy as a priority.

At that time, the manufacturing engineer at Global Wood Concepts learned that 50 trucks per month were

hauling waste particleboard to landfill, which cost thousands of dollars. He devised a plan for the company to grind the waste particleboard and sell it as a fuel for heating greenhouses.

This early success was critical; it set the company on a course of striving to eliminate waste in all areas of its operations over the next several years.

#### Lighting retrofit

The first project to create noticeable improvements in energy use was a lighting retrofit in 2006. Old and inefficient metal halide, high-ceiling lights were replaced with more energy-efficient T-8 fluorescents lights throughout the manufacturing plant. The project was relatively simple to implement and began to produce results virtually overnight. "These early successes made it easier to generate buy in at senior levels and implement more projects," says Vladimir Rabinovitch, project manager and manufacturing engineer.

#### Water heating system overhaul

In 2009, Global Wood Concept implemented a major overhaul of the plant's outdated water heating system that had been installed in the 1960s. It was costly to repair and was only about 40 percent efficient. "There was a strong return on investment (ROI) potential with the heating system so we seized on that as a logical next step," says Rabinovitch. The project was supported by the saveONenergy Retrofit Program as well as cost-sharing arrangements with Enbridge (\$4,480) and Ontario's Ministry of Natural Resources and Forestry (\$21,910), creating a valuable incentive.

#### Updating machine operations

In 2010, Global Wood Concepts targeted machine operations. Cost sharing from Toronto Hydro (\$16,785) and Natural Resources Canada (NRCAN) created a favorable payback period.

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**Air drill replacement: Charging station for the cordless tools that replaced the air drills. Estimated annual savings: 36, 832 kWh or \$5,893.**

### Modernizing tools

In 2014, the company replaced its air drills with battery-operated cordless tools. In this case, the change was met with real skepticism from workers, some of whom had worked with air tools for 25 years. “Now they’re onside because the new tools are easier and safer to use,” says Rabinovitch. Annual savings are about 36,832 kWh for this project alone and will save Global Wood Concepts about \$5,893 a year for a two-year ROI.

*“When you start to analyze the success of your projects, you drive the next project, and the next one after that. For us, this process was essential in moving toward ISO 50001 certification.”*

—Rabinovitch

### **Implementing an Energy Management System**

When ISO 50001 certification became available in 2011, the team at Global Wood Concepts began to consider how they could formalize the company’s efforts toward

certification. At that time, they viewed ISO 50001 as achievable only by large corporations. However, by 2014, Rabinovitch and his team had collected a large amount of operational data, calculated the potential ROI and built a business case to present to senior management.

The team calculated that certification would require a significant financial investment (about \$150,000). But with cost sharing from NRCan of up to \$40,000, they saw that becoming Canada’s first furniture manufacturer to receive certification was within reach.

### Get it in writing

An important early step was to get commitment from senior management. The company president committed financial and human resources for ISO 50001 certification, and this was publicly announced for all employees. At that point, there was no way to back out; the organization was committed to building an ISO certified energy management system (EnMS) that was comprehensive and sustainable.

*“If senior management is not committed, you are wasting your time. You need support from human resources, financial management and technical. A single person working as energy champion cannot complete all that is necessary to achieve certification.”*

—Rabinovitch

### Get an energy audit

With a firm commitment in hand, the team at Global Wood Concepts contacted several energy audit companies, and ultimately selected Impact Energy Services Inc. In 2015, Impact Energy conducted a comprehensive energy audit, including a complete energy profile and a report on the savings opportunities that the company could realize. Such an audit is critical for assessing a company for energy efficiency, energy consumption, where the energy is being used, the

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number of users involved, and a general inventory and baseline of use.

However, such audits can be costly. Says Rabinovitch, “A key step was to get financial support from government.” That was important in engaging senior management, as we had to convince them to dedicate resources, time and money upfront.”

A \$40,000 cost-sharing arrangement from NRCan for companies that become ISO 50001 certified was a significant incentive. Toronto Hydro contributed 50 percent of the audit cost through the saveONenergy Retrofit Program. “Once company management realized we could get paid for implementing – aside from the energy savings – it was a turning point.”

### Form an energy management team

Rabinovitch has propelled energy efficiency projects since 2006, so he has plenty of experience. But with solid teamwork, an energy champion has much more power to drive change. Global Wood Concepts established an energy management steering committee in 2014 that includes all senior managers and meets once a month to discuss successes, challenges and upcoming projects.

In addition, a health and safety committee and an environmental committee meet regularly to identify opportunities for greater energy efficiency. Both include production floor staff, supervisors, plant managers and maintenance managers. All employees are encouraged to share their ideas for energy management – a strategy that helps produce deep culture change.

### Set a baseline and plan for the future

With ISO 50001 now in place and a strong culture change accomplished, Global Wood Concepts has set annual targets for energy savings and installed a stronger framework for success. An energy use indicator calculates monthly how much energy the company has spent per unit produced.

Global Wood Concepts estimated a 5.00 percent reduction in energy consumption per unit produced for

2015. The company’s 10-month performance statistics showed the actual reduction to be 3.26 percent.

“Our energy management system is showing results,” says Rabinovitch. “We’re using less energy with more machines operating. We will try for 5 percent next year.”

Global Wood Concepts will establish a new target in 2016 and an action plan for realizing it. Possible projects include:

- Eliminating inefficient space heaters throughout the building.
- Replacing aging thermostats.
- Installing energy-efficient LED lights at loading docks.
- Replacing older machines with newer versions that have energy-efficient motors and devices and systems that reduce energy consumption in standby mode.

### Challenges and Barriers

- Mental barriers – Once deep culture change has taken hold, energy efficiency improvements are simpler to “sell” to the company.
- Physical barriers – It can be complicated to retrofit new equipment into tight work spaces. Careful planning was a key requirement at Global Wood Concepts.
- Production disruptions – All major changes had to be implemented over holiday shutdowns to minimize disruptions. For smaller projects, weekends were sufficient.
- Cost – Although costs can be prohibitive, government and utility cost sharing provides better payback periods. This can make the difference between getting a project approved – or not.
- Resistance to change – People are most comfortable with processes they know. Eventually, though, everyone will see the benefits of improving energy efficiency.

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- Lack of understanding – It is important to give people time to get used to the idea of energy efficiency. Clear communication is of utmost importance.

### Lessons Learned

- Even one person, if they are dedicated, can develop projects in energy savings. You can make a big difference if you have the will.
- Get senior management onside as early as possible. Their support is key to your work.
- As in a chemical reaction, you need a catalyst for successful energy improvement. Once employees start to see a difference, everyone wants to get on board.
- Persistence is everything. Many employees and senior managers will have trouble believing the savings are worth the investment. The energy champion must often make the case time and again.
- Have fun on the journey and you will succeed. If creating something new every day interests you, there is a much greater chance you will make a difference in your company.



In line air reducers: Previously, all equipment was connected directly to the compressed air system at 120 psi – more pressure than many machines and tools needed. Devices were installed (see arrows) that limit air pressure to 60 psi or 90 psi. Estimated savings: 17,365 kWh or \$2,777.

Through the Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit [www.cleanenergyministerial.org/energymanagement](http://www.cleanenergyministerial.org/energymanagement).

