CIPEC ANNUAL REPORT 2014

10 Outstanding Achievements in Energy Management

Canadian Industry Program for Energy Conservation

Canada

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Efficiency Powers Profitability

10 Outstanding Achievements
in Energy Management

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CIPEC Leadership Awards

10 Outstanding Achievements in Energy Management

3M

CHRYSLER

BARRICK
HEMLO

PEPSICO
CANADA
FOODS - ALIMENTS
FritoLay CANADA
QUAKER

KI
Furnishing Knowledge®

ebi énergie

Freshwater Fisheries Society of BC

newgold™ New Afton Mine

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About CIPEC

The Canadian Industry Program for Energy Conservation (CIPEC) is a voluntary industry-government partnership established to improve Canada's industrial energy efficiency. CIPEC is funded under the ecoENERGY Efficiency for Industry initiative.

The 27-member CIPEC Task Force Council includes volunteer representatives from each of CIPEC's 21 industrial sectors, which encompass more than 2,400 facilities and more than 50 trade associations. Each CIPEC task force represents companies engaged in similar industrial activities. The Task Force Council provides a forum for sectors to share ideas and recommend ways to address common needs. It includes representatives from every CIPEC sector task force. Overall direction is provided by the CIPEC Executive Board, made up of private-sector leaders who are champions of industrial energy efficiency and who provide advice on industrial energy efficiency programs and related issues to the Government of Canada.

In the CIPEC partnership, change emerges from consensus and joint action developed through open communication. CIPEC continues to be the focal point for industry's response to Canada's energy efficiency efforts.

CIPEC's role is to promote greater energy efficiency and to recognize and reward trendsetters. At its industrial energy efficiency conference, CIPEC presents the CIPEC Leadership Awards to honour Canadian companies that have demonstrated a significant and innovative contribution to energy efficiency. In 2011, the Future Leaders Award category was created to honour post-secondary students and recent graduates whose projects or initiatives have impacted industrial energy efficiency in a considerable way. During the Energy Summit held on May 14 and 15, 2014, CIPEC recognized 10 outstanding leaders in energy management. Close to 300 industry leaders attended the ceremony during the summit.

Part of CIPEC's mandate is a strong communications and awareness program anchored in its *Heads Up CIPEC* newsletter, which has a readership of more than 10,500 subscribers. CIPEC also raises awareness of the goals and benefits of improved energy performance. The Task Force Council and sector task forces are constantly working toward broadening participation, encouraging information sharing and bolstering awareness of the role and achievements of CIPEC members.

CIPEC volunteers include successful business leaders and nationally recognized players. The profiles of these leaders and their strong belief in CIPEC's principles attract new members from industry, building on the successful partnership between industry and government.

Our Mission

To promote effective voluntary action that reduces industrial energy use per unit of production, thereby improving economic performance while participating in meeting Canada's climate change objectives.

JOIN CIPEC

Participate in CIPEC by registering your company's commitment to energy efficiency improvements and greenhouse gas (GHG) reductions. Signing up as a CIPEC Leader is free and provides eligibility for a broad range of benefits:

- cost-shared assistance
  - implementation for the Energy Management Systems standard (ISO 50001)
  - process integration (PI) studies
  - computational fluid dynamics studies
  - other energy management projects
- Natural Resources Canada's (NRCan's) Dollars to $ense Energy Management workshops (including opportunities to have them delivered on-site and customized to meet specific company needs)
- free monthly webinars on innovative energy practices such as:
  - energy management information systems (EMIS)
  - ISO 50001 Energy Management Systems standard
  - PI and computational fluid dynamics
  - motor systems management
  - compressed air
  - boiler efficiency
  - RETScreen® Clean Energy Management software
- eligibility to nominate your organization for a CIPEC Leadership award
- technical guidebooks and tools
- *Heads Up CIPEC* – a monthly e-newsletter that provides the latest energy efficiency information
- opportunities to network with other industrial energy managers and practitioners

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Message from the Chair

As the new Chair of CIPEC, I have been looking forward for some time to writing this letter for the 2014 annual report. I consider the report to be a key tool for CIPEC members in gauging the progress their peers and the industry as a whole have made toward energy efficiency.

Indeed, a brief scan of this annual report is a lesson in the concrete steps our CIPEC Leaders are taking to use energy more wisely. They are using advanced technology to turn biomass into fuel, sophisticated software to measure and improve performance, and the ISO 50001 standard to bring their energy saving capabilities to the next level – to name just a few. This report is also a lesson in how an entire industry can shift once momentum has built sufficiently among its member companies.

I am proud to report that in 2013–2014 alone, CIPEC Leaders recorded total annual energy savings of 1.65 petajoules (PJ) – enough to power about 19,200 households – and reduced annual GHG emissions by an estimated 170 kilotonnes (kt). While these numbers are certainly impressive, even more significant is the fact that they were achieved voluntarily.

That, I believe, is the foundation of our success. All CIPEC Leaders who enable Canada to succeed in the realm of industrial energy efficiency share a voluntary commitment. The many CIPEC Leaders that we welcomed in 2013–2014 are now part of this proud tradition. Since 1975, CIPEC has grown to include more than 2,400 Leaders, and we are moving steadily upward in numbers – more evidence of momentum across Canada.

One tool helping create success for CIPEC Leaders is the ISO 50001 Energy Management Systems standard, which CIPEC continued to champion in 2013–2014. The standard provides a framework on which an organization can build the foundation for an energy management program. Such a foundation provides for managing energy use efficiently, identifying more eloquent energy savings opportunities and more effectively implementing activities to improve energy consumption. The standard also serves as a strong motivator for industry to implement an EMIS, which helps companies keep close track of the energy they are using. You can read more about CIPEC Leaders' success with ISO 50001 in several case studies on our website.

CIPEC's Dollars to $ense Energy Management workshops continued to be a valuable product of the partnership between the public and private sectors. These workshops are delivered by NRCan's Office of Energy Efficiency (OEE) and are an important support to organizations looking to improve their energy management performance. The OEE delivered 142 workshops last year, and we are looking ahead to another busy year of delivery.

Also growing in popularity are monthly webinars on topics of great interest to CIPEC members, such as motor management, HVAC systems, the ISO 50001 Energy Management Systems standard and EMIS. These free webinars provide CIPEC member companies with advanced information that ranges from identifying energy management opportunities to financing equipment upgrades that can yield significant savings.

Key to maintaining our momentum is recognizing individuals and organizations that have distinguished themselves as champions of responsible energy use. I had the honour of serving as Master of Ceremonies at the Energy Summit 2014 dinner and CIPEC Leadership Award Ceremony, where we welcomed about 300 participants to share knowledge and celebrate our success in energy performance. During this important event for the energy efficiency community, we staged more than 20 workshops and guest speakers and also had the pleasure of presenting Leadership Awards to 10 recipients in six categories.

As the new Chair of CIPEC, I am hoping we can take steps to build on this momentum. I have certain aspirations for Canadian industry's energy efficiency performance during my tenure, as well as some ideas about how we can achieve it. I believe we can make progress in our collaborative efforts with other organizations. We have deep roots in a well-respected professional community, and I'd like us to start leveraging those relationships to disseminate our messages and expand our portfolio.

I would also like CIPEC to communicate its message to even more graduate students working in engineering and other science-related fields. So many young people have so much to contribute to our work. We honoured two such individuals as CIPEC Leaders in 2013–2014. You can read about them in this report under the category of Future Leaders.

In addition, I would like CIPEC to communicate the message that industries have a unique economic opportunity in embracing energy efficiency. In today's global business environment, markets make it a challenge to gain a competitive advantage via human resources, equipment or process efficiencies. Energy management, however, provides industry with one lever it can use to lower its costs. I would like CIPEC to ensure that Canadian industries understand that reality – and bring to bear what may be the greatest cost saving tool they have at their disposal today.

In closing, I would like to thank my colleague Glenn Mifflin, the outgoing Chair of the CIPEC Board, for the excellent job he did throughout his tenure. I have inherited a post from Glenn that is steadily moving CIPEC toward greater successes and results, and I'm grateful to him for his dedication and hard work.

Sincerely,

Andrew Mahut
Chair, CIPEC Executive Board

The Results

CIPEC brings exceptional value to Canadian industry while supporting Canada's drive to improve energy efficiency and reduce GHG emissions. Its extraordinary impact is clear – CIPEC delivers results.

The share of Canada's gross domestic product (GDP) created by CIPEC industries increased by 40.9 percent between 1990 and 2012. With the help of effective energy management, energy consumption by these industries rose by only 25.2 percent.

In 2012, CIPEC industries produced about 28 percent of the country's GDP and provided jobs for about 3.5 million Canadians.

The more than 5,900 facilities that CIPEC sectors represent reduced their combined energy intensity by 11.2 percent between 1990 and 2012, an average of 0.5 percent per year.

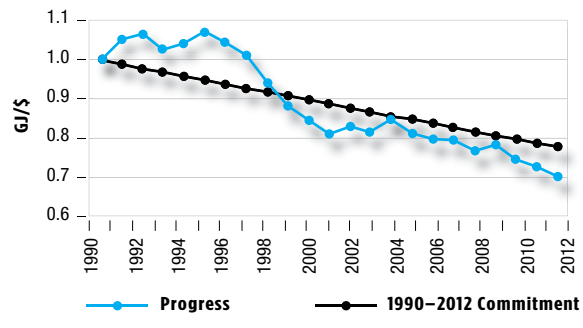
Improved energy efficiency enabled Canadian industry to avoid about $3.3 billion in purchased energy in 2012 – enough energy to heat almost 4.4 million Canadian households for one year. Had energy intensity remained constant, GHG emissions from CIPEC industries would have been 45.2 megatonnes (Mt) higher.

From the fall of 1997 to March 31, 2014, the CIPEC Dollars to $ense Energy Management workshops helped companies save an estimated 11 PJ of energy, equivalent to $160 million in annual energy savings, and reduced carbon dioxide (CO_2) emissions by more than 1.1 Mt.

The *Heads Up CIPEC* newsletter was distributed electronically monthly and reached more than 10,500 recipients across Canada.

More than 2,400 industrial facilities have signed on as CIPEC Leaders since 1975.

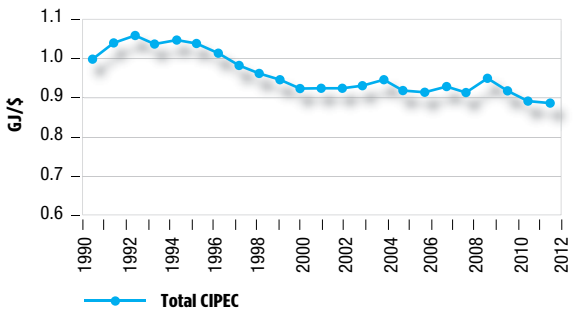
Mining, Manufacturing and Construction Energy Intensity



GJ: gigajoule

The mining, manufacturing and construction sectors improved their energy intensity by an average of 1.3 percent per year between 1990 and 2012. This rate surpasses the public voluntary commitment made by these CIPEC members to achieve an average annual energy intensity improvement of 1 percent per year.

Total CIPEC Energy Intensity



Between 1990 and 2012, all CIPEC industries improved their combined energy intensity by 11.2 percent or an average of 0.5 percent per year. If energy intensity had remained constant, GHG emissions would have been 45.2 Mt higher in 2012.

CIPEC Leadership Awards

Ten outstanding achievements in energy management

Every two years, innovative Canadian companies compete for the CIPEC Leadership Awards. To win, entrants must demonstrate a significant and innovative contribution to responsible energy use.

Award winners are honoured at the CIPEC Leadership Awards ceremony – the signature event at the CIPEC industrial energy efficiency conference. The Energy Summit 2014 conference drew about 300 industry leaders to Niagara Falls, Ontario (Ont.), on May 14 and 15. The conference was co-hosted by CIPEC and the Excellence in Manufacturing Consortium – a member of CIPEC and a leader in promoting energy-saving practices with industry.

To be eligible for the CIPEC Leadership Awards, applicants must be registered CIPEC Leaders, and only projects completed between June 1, 2011, and March 3, 2014 were eligible. The projects were evaluated by a panel of judges against the following criteria.

Relevance (determines the award stream)

- Energy policy and programs
- Energy sources, processes and technologies
- Performance analysis
- Energy awareness
- All of the above

Impact (determines the award recipients)

- Energy performance – reduction in energy use per unit of production
- Innovation – ingenuity and creativity in the use of an improved or novel idea, method or process
- Potential for broad application – transferability to other companies or industry sectors
- Environmental contribution – reduction in GHG emissions and improvement in environmental sustainability

FIVE AWARD CATEGORIES

Winning projects were as diverse as the products their companies produce, but they all had one thing in common: an outstanding commitment to improving industrial energy efficiency.

1. CORPORATE STEWARDSHIP

Winners in this category promoted energy efficiency at the corporate level by the creation and engagement of an energy management team, the development of a corporate energy management plan or policy, or the implementation of a formalized management system.

WINNERS

3M Canada Company, Brockville, Ontario

Winning edge: a world-leading energy management program that is replicated throughout all subsidiaries

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Chrysler Canada Inc., Brampton, Ontario

Winning edge: automotive assembly plant demonstrates the value of ISO 50001 within its energy management regime

2. PROCESS AND TECHNOLOGY IMPROVEMENTS

These winning companies reduced energy intensity in an industrial process by improving procedures and equipment such as refrigeration or compressed air systems.

WINNERS

EBI Énergie inc. – Dépôt Rive-Nord, Saint-Thomas, Quebec

Winning edge: extensive design and technology elements that turn biogas into energy

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Freshwater Fisheries Society of BC, Clearwater, Abbotsford, Fort Steele, Summerland and Duncan, British Columbia

Winning edge: a marketable technology that reduces water and energy use and contributes to a healthier environment for young fish

3. ENERGY PERFORMANCE MANAGEMENT

The award winner in this category enhanced the monitoring of, measuring of and reporting on facility or company-wide energy consumption and improved energy performance.

WINNER

New Gold Inc. – New Afton Mine, Kamloops, British Columbia

Winning edge: a software program that enables all staff to make sound decisions about energy performance improvement

4. EMPLOYEE AWARENESS AND TRAINING

The award winner in this category raised employee awareness and understanding of energy efficiency and promoted best practices through knowledge exchange.

WINNER

KI Pembroke LP, Pembroke, Ontario

Winning edge: an awareness program that enabled the company to triple its energy saving goals in the first year

5. INTEGRATED ENERGY EFFICIENCY STRATEGY

These winners improved energy efficiency at a facility or on a company-wide level through a range of initiatives as a result of an integrated strategy.

WINNERS

PepsiCo Foods Canada, Mississauga, Ontario

Winning edge: a wide-ranging resource conservation program that draws from global and local best practices and innovations

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Barrick Gold-Hemlo, Marathon, Ontario

Winning edge: a company-wide energy conservation scheme that identifies 10,000 megawatt-hours (MWh) per year in energy savings

CIPEC FUTURE LEADERS AWARD

The CIPEC Future Leaders Awards recognized individuals who are attending university or have recently graduated and have completed a project (theoretical or applied) that advances industrial energy efficiency in Canada. The projects fell into one of the following categories.

Leading-edge projects: These projects involved advanced technologies or approaches that apply or could apply in the future to an industrial setting.

Applied projects or initiatives: These practical projects were developed and implemented in an industrial setting.

The winners were selected by evaluating them against the same criteria used for the CIPEC Leaders awards:

- **Energy performance** – reduction in energy use per unit of production
- **Innovation** – ingenuity and creativity in the use of an improved or novel idea, method or process
- **Potential for broad application** – transferability to other companies or industry sectors
- **Environmental contribution** – reduction in GHG emissions and improvement in environmental sustainability

WINNERS

Antony Hilliard – PhD candidate, Mechanical & Industrial Engineering, University of Toronto

Winning edge: a statistical model that brings greater benefits to standard CUSUM charts

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Andre Pelletier – PhD candidate, Limerick Pulp & Paper Centre, Department of Chemical Engineering, University of New Brunswick

Winning edge: research enables pulp mills to produce a high-quality product using less energy

CIPEC LEADERSHIP AWARD

CORPORATE STEWARDSHIP

3M Canada's energy conservation retrofits and programs have reduced the company's environmental footprint by 11,000 t of CO_2 per year.

3M CANADA COMPANY

Extensive experience and focused commitment create a world leader in energy conservation.

3M Canada's energy conservation activities date back to the early 1970s when parent organization 3M Company launched a corporate-wide energy management group. In the years that followed, 3M implemented projects such as introducing more efficient technologies in its manufacturing operations and incorporating energy saving measures into its product development activities.

But it was in 2008, after 3M Canada established a formal energy management program, that the company began to implement the more than 60 energy conservation improvement projects that have distinguished it as an energy efficiency leader among 3M companies worldwide.

"No other program can bring as much success and payback as an energy management program, and the best vehicle we have found is ISO 50001 implementation," says Andrew Hejnar, 3M Canada's Energy Manager. "Properly implemented, an energy management system provides a structure for energy management activities that embed the practices into the corporate culture."

Great results grow from many details

Opportunities for improvement at 3M have always been manifold. Best known as the company that makes Post-it® notes, 3M today develops and manufactures 55,000 products, from tapes to cleaners to reflective signage for highways. 3M Canada has about 1,900 employees and operates seven manufacturing facilities across the country.

"Our energy-related work has included boiler improvements, lightning retrofits and installing heat recovery technologies, to name just a few," says Hejnar. "When you start small, like changing lights, the benefits start to become noticeable. Then you see success and begin to add more small projects. The benefits add up to major savings."

The result of 3M's energy management practices has been a steady reduction in energy intensity of 3 percent per year, measured in British thermal units per pound (BTU/lb.). More specifically, projects completed between 2011 and 2013 helped 3M Canada reduce its natural gas consumption by 4 million cubic metres (m^3), reduce electrical demand by 1,150 kilowatts (kW) and save about 12 gigawatt-hours (GWh) of electricity.

Careful measurement is key

Hejnar says that the regular collection of high-quality information, which the company then uses to analyze its performance, is fundamental to the success of the energy management program. 3M Canada monitors

and meters all significant users of energy at its manufacturing facilities, and all plants meticulously report their energy consumption, costs and conservation activities.

"Energy is invisible to most people," says Hejnar. "Our metering system enables us to view it directly – to see where the energy is going and how much is being used."

Two facilities – one in Brockville and another in London, Ont. – use advanced meter monitoring and targeting systems. Both facilities have ISO 50001 certification, and the Brockville plant also achieved the superior energy performance (SEP) platinum designation as part of the U.S. Department of Energy's program. The Brockville plant is the first plant in Canada and the second in the world to achieve the combined designation at platinum level.

Unique and creative solutions

3M's energy conservation solutions extend well beyond its SEP and ISO certifications. In one novel project, the Brockville facility uses water that has been heated as part of the manufacturing process to heat the building rather than letting the heat vent to the atmosphere. This innovation has saved almost 100,000 m^3 of natural gas and 84,000 kilowatt-hours (kWh) of electricity worth $29,975 per year.

In another project, the vast majority of exterior lights in Brockville and other Eastern Ontario locations have been replaced by LED technology. "The use of LED and the extent of the retrofit are the novel aspects of that program," says Hejnar, which has saved more than 240,000 kWh of electricity or $29,000 in one year. The savings enabled 3M to recoup its investment in two and a half years.

A renovation to 3M's London headquarters that took advantage of the natural light coming into the building through windows has resulted in the removal of 750 light bulbs and the addition of 56,250 kWh of electricity at no cost.

A well-supported team

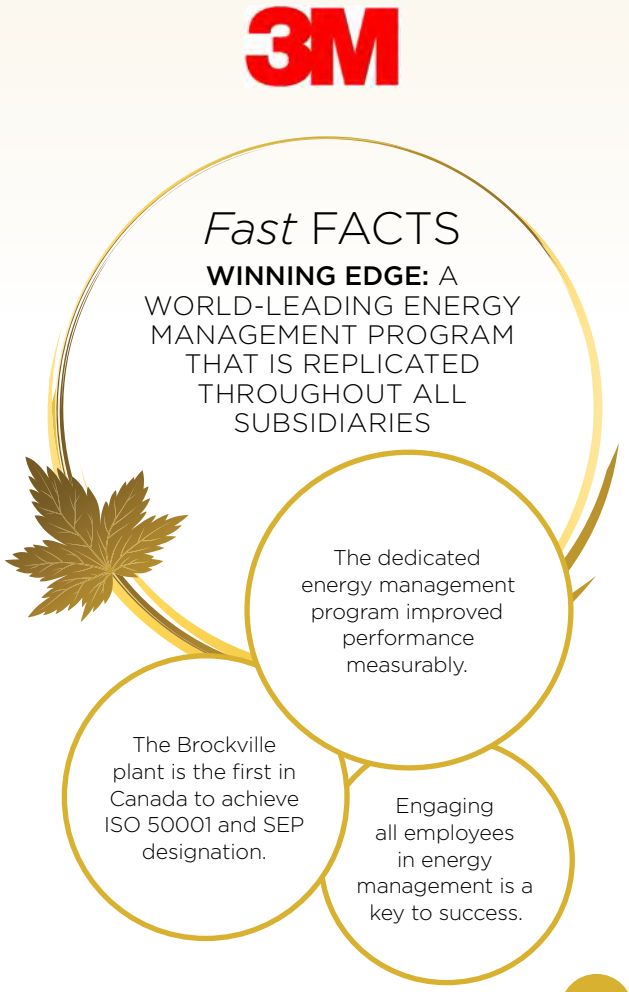
The company is confident that major improvements in energy conservation are possible only if all staff are well trained and deeply engaged in the process. That is why 3M Canada includes an intensive training module delivered as part of the corporate training package, a yearly energy awareness quiz that requires an 80 percent passing grade and a company-wide suggestion system that encourages participation by all employees.

"We feel that everyone is responsible for energy management," says Hejnar. "Engaging people at all levels and providing training for existing workers every three years as well as for each new hire ensures that our energy efficiency culture remains strong."

Hejnar says that 3M Canada does more than simply educate its employees. It also rewards individuals who practise energy management and come up with innovative ideas for saving energy. "Employees receive 3M points, which is an internal recognition system that equates to shopping dollars, for the good work they do, including improving energy conservation. They can trade these 3M points for products, vacations and other rewards."

Spreading the culture globally

3M Canada's success in energy conservation is being replicated in 3M subsidiaries throughout the world. In addition, 3M Canada, working collaboratively with NRCan and the U.S. Department of Energy to pilot new SEP and ISO certifications, has carefully documented its experience and best practices so that other companies will benefit from its experience and knowledge.



CIPEC LEADERSHIP AWARD

CORPORATE STEWARDSHIP

CHRYSLER CANADA

The Brampton assembly plant successfully piloted the ISO 50001 standard for the automotive industry.

"The methodology of ISO 50001 has been a major element in the success of our energy performance improvement efforts."

Energy is among the largest costs in automobile manufacturing, and Chrysler has vigorously attacked the issue of energy waste in its facilities since 2009 and seen significant success since then. But in addition, the 2013 implementation of the ISO 50001 Energy Management Systems standard within Chrysler Canada's existing methodology has improved the organization's approach to reducing energy consumption and succeeded in engaging help from employees across the plant.

"The methodology of ISO 50001 has been a major element in the success of our energy performance improvement efforts," says Bill Craig, Facility Engineering Manager at Chrysler Canada's Brampton assembly plant. "We were the first automotive manufacturing plant in the world to implement ISO 50001, and we are the only one to date that has integrated it with World Class Manufacturing (WCM). It has been successful enough that Chrysler intends to implement it across all its other facilities."

WCM is a method that focuses on reducing waste, increasing productivity and improving quality and safety and has been the bedrock of Chrysler Canada's energy saving regime for several years. The method depends on employee input and works proactively to elicit suggestions from the workforce on how jobs and plant processes can be improved. Chrysler's Brampton facility employs 3,242 workers on two shifts and spends significant money on annual energy costs. Therefore, implementing new processes for energy management in a manner that elicits employee input had the potential to make a profound difference in the organization's energy management performance.

"In any major undertaking to reduce energy consumption, it is critical to ensure that all employees understand the process involved in creating energy savings," says Craig.

"One of the reasons Chrysler selected us as the pilot site for ISO 50001 is that they recognized that we have a great team and a great ability to improve our processes."

Reduce consumption

The plant's primary focus is to reduce electricity and natural gas consumption. For example, its paint and spray booths draw millions of cubic metres of outside air per minute, thereby consuming a great deal of electricity and natural gas to maintain the correct temperature. And the enormous size of the plant building draws significant energy for heating and cooling the work environment.

The first step in reducing energy consumption is to undertake a plant energy review. The energy review defines significant energy users throughout the plant and develops plans to reduce energy waste in those areas. Chrysler Canada uses EnPI 3.0 as its method of tracking energy data and setting objectives and targets. EnPI, developed by the U.S. Department of Energy, uses a regression model to help plant management establish a baseline of energy consumption and then track improvements in energy intensity, energy savings and other indicators of success. The EnPI along with the WCM cost deployment output drive the development of more detailed objectives and targets at Chrysler Canada that are designed around the significant energy users identified in the initial energy review.

The next step is to apply the WCM "Kaizen" approach, which uses prioritization charts derived from data analysis to drive the implementation of new projects. The charts identify which issues are largest and potentially most beneficial with respect to dollar per cost dollar; those become the focus of improvement activities.

Once new projects are initiated, the project team develops a training program to ensure that all employees affected by the project have the right competencies and leadership skills to see it through. As well, once the projects are initiated, the team undertakes a root cause analysis to ensure that they are attacking the right problem with the right solution. When the project is complete, the team presents the results to senior management, including lessons learned.

"Our approach is multi-step and complex, which requires a great deal of rigour in our planning and implementation," says Craig. "ISO 50001 has broadened the implications of our energy performance improvement by upgrading the quality of our data, strengthening the support of senior leadership and heightening the awareness of energy issues on the shop floor."

In one project to attack energy waste, Chrysler Canada implemented an energy management system to control heating and ventilation costs on the shop floor. It included replacing control panels, removing floor-level controls, revising an air handling logic unit and implementing an energy management system and scheduler. The new system now provides Chrysler with better data acquisition, analysis and real-time control of its system. That project alone is expected to lead to significant annual savings of more than 1 million kWh and a similar amount in natural gas. Along with other projects, the plant has achieved a 27 percent reduction in gigajoules/non-production day and a 9 percent improvement in space heating efficiency.

Now that Chrysler has proven the usefulness of ISO 50001 for improving energy management in an automotive manufacturing facility, the company will implement the standard at other North American facilities. "All other Chrysler plants will be certified," says Craig. Chrysler has nine other assembly plants, two casting plants, 10 powertrain and component plants and four stamping plants.

CHRYSLER

Fast FACTS

WINNING EDGE:
AUTOMOTIVE ASSEMBLY PLANT DEMONSTRATES THE VALUE OF ISO 50001 WITHIN ITS ENERGY MANAGEMENT REGIME

ISO 50001 brings energy management from senior management to the shop floor by improving methods in standards, measurement, project execution and communication.

The plant realizes a 27 percent reduction in gigajoules/non-production day and a 9 percent improvement in space heating efficiency.

Chrysler plans to implement ISO 50001 across all its North American assembly plants.

CIPEC LEADERSHIP AWARD

PROCESS AND TECHNOLOGY IMPROVEMENTS

The plant's energy performance exceeds, by 48 percent, a similar building designed to the model energy code.

EBI ÉNERGIE INC.

A sophisticated cogeneration plant helps this waste-disposal company recover energy from biogas.

EBI Énergie inc. is a leader among Canadian waste disposal and recovery companies. Founded in 2001 as part of the EBI Group, the company is committed to sustainable development and the protection and preservation of the environment. In particular, its mission is to maximize the conversion of biogas – a combustible byproduct of decomposing organic matter – into various forms of energy.

Therefore, it should come as no surprise that the company has twice been at the forefront of implementing impressive waste management solutions. In 2003, EBI Énergie opened a treatment facility that converts biogas into commercially viable natural gas that it then pumps into the provincial gas network. More recently, the company opened a cogeneration plant that converts biogas into electricity and heat. The cogeneration plant has been designed to attain Leadership in Environmental Energy Design (LEED) Platinum certification (the highest possible under the international green-building rating system). The plant produces more energy than it uses, which enables EBI Énergie to sell its surpluses to Hydro-Québec.

A comprehensive approach to building green

EBI Énergie completed a 2,053 square metre (m^2) biogas generation plant in Saint-Thomas, Quebec, in June 2012. Throughout the building's design and assembly, the EBI Énergie leadership team included as many green-design elements as possible to ensure the building met the LEED Platinum standard.

For example, the building's biogas recovery and processing systems create sufficient energy to power all the building's operations – something no other building in the province

can do. Designers created systems to recover 7.4 megawatts (MW) of waste heat from the generators. That energy is used to heat the building, its hot water systems and, in the colder months, the onsite leachate ponds that help collect and treat liquid waste runoff before it is returned to the environment.

Interior lighting and ventilation systems are powered as needed by using occupant-detection systems. For example, lighting is kept to a minimum in the plant's generator room most of the time. But when machines in that room require maintenance work, technicians can increase light intensity around specific machines. Natural light has been introduced throughout via skylights, windows and glass doors to reduce energy use, and motion sensors turn lights on and off as spaces are occupied and vacated. Meanwhile, the air-conditioning system is equipped with CO_2 detectors to deliver more fresh air when parts of the buildings are occupied.

The building's frame was constructed using a high proportion of materials that have recycled content, such as steel, exterior metal siding and gypsum. Forty percent of materials used in construction were sourced locally (many of them from the immediate area), and 95 percent of the building's construction waste was recycled.

The building's energy-friendly innovations also show through in more subtle ways. There are very few parking spaces onsite to compel employees to carpool to work, while dedicated spaces have been reserved for electric cars. Exterior plant lighting has been controlled to minimize light pollution, and water runoff from the roof and parking lot is directed away from nearby wetlands.

A model of energy efficiency

But what really sets the cogeneration plant apart is that all the energy it uses comes from renewable sources. Meanwhile, the plant generates 9.4 MW of electricity – or about enough to power 10,000 homes – simply from the waste product that it was designed to collect.

TST Energy Systems Inc. is the sustainable-development consultancy that helped design the building. Their simulations show that the plant's energy performance exceeds that of a similar building designed to the model energy code by 48 percent. Remarkably, that figure does not account for the impact of the biogas-recovery and cogeneration process. As well, the building's operating costs are 92 percent less than those of a baseline building designed to the model energy code.

Other noteworthy examples of the building's energy performance include a 96 percent reduction in energy used for electric heating, an 85 percent reduction in energy used for pumping and humidification, a 62 percent reduction in energy used in the ventilation system, and the outright elimination of electric energy used to heat hot water.

A tool for teaching, a project for export

Part of EBI Énergie's mandate is to raise awareness of environmental issues and encourage members of the public to learn about ways of protecting the environment. To that end, the company ensured that its Saint-Thomas plant would be open to the public as a teaching centre. Groups are regularly invited to tour the facility, learn about waste recovery and better understand the company's approach to integrated waste management.

Flush with the success of the Saint-Thomas plant experience, EBI Énergie is considering applying a similar model to its other landfill operations in Quebec and Costa Rica.

ebi énergie

Fast FACTS

WINNING EDGE:
EXTENSIVE DESIGN AND TECHNOLOGY ELEMENTS THAT TURN BIOGAS INTO ENERGY

- The plant generates 9.4 MW of electricity– enough to power 10,000 homes.
- The company will apply a similar model to other operations in Quebec and Costa Rica.
- Green elements are incorporated into all aspects of the building design and operations.

CIPEC LEADERSHIP AWARD

PROCESS AND TECHNOLOGY IMPROVEMENTS

FRESHWATER FISHERIES SOCIETY OF BC

A non-profit society develops proprietary technology to reduce water use and energy consumption.

Airlift technology has helped this organization realize an annual saving of 3.28 billion litres (L) of water (44.2 percent) at its Vancouver Island Trout Hatchery.

A new water recirculation technology developed in-house has enabled the Freshwater Fisheries Society of BC (FFSBC) to achieve significant reductions in energy use in its hatchery operations.

The FFSBC is an independent non-profit organization that conserves and enhances British Columbia's (B.C.) freshwater fish resources. The organization provides fish culture and stocking services, promotes recreational fishing, and educates the public about fish, conservation and fishing.

FSSBC operations include five major fish hatcheries throughout the province. These hatcheries account for about 97 percent of the FFSBC's entire electrical energy cost. Between 60 and 70 percent of this electricity is consumed to pump a constant flow of water – hundreds of millions of litres each month – to keep young fish healthy and growing.

Developing a proprietary solution

In 2009, the FFSBC reviewed options to reduce both water and electricity consumption. Off-the-shelf water recirculation systems

were considered too expensive to buy, install and maintain. Instead, the FFSBC set out to build its own solution. In a project co-funded by BC Hydro, the FFSBC designed and installed airlift water reuse technology in a demonstration project at the organization's Vancouver Island Trout Hatchery in Duncan, B.C. The project compared the FFSBC's new technology with an off-the-shelf system and a previous airlift design.

"In the new airlift design, pumps are located either along the inside wall of a circular fish rearing tank or equally spaced along the length of a raceway tank," said Ray Billings, the FFSBC's Vice-president, Strategic Initiatives and Energy Manager. "A blower feeds a continuous supply of low pressure air through a porous membrane at the bottom of each pump." The air dissolves into the fish-rearing water, increases oxygen levels and dissipates CO_2 from the water to the atmosphere. The water then rises inside the airlift pump and flows back into the tank to help keep it clean.

Exceeding performance expectations

The project exceeded the goal to save 50 percent of the total raceway water consumption; in fact, reductions of up to 80 percent were achieved in some individual raceways. Overall, the airlift technology helped the FFSBC realize an annual saving of 3.28 billion L of water (44.2 percent) at its Vancouver Island Trout Hatchery. That volume is equivalent to more than 1,300 Olympic-sized swimming pools and a dramatic reduction in the use of groundwater resources.

The hatchery reduced electricity consumption by 324,390 kWh in the first year following the installation of the airlift system for an overall reduction of 30.6 percent. At $0.06/kWh, this amounted to an annual operating cost saving of $19,463. "Factoring in BC Hydro's incentive gives us a simple payback period of 3.9 years," said Billings. "The project has an average annual return on investment of 28 percent, and 560 percent over the 20-year expected life of the project."

Broader system implementation

The airlift technology has proven so effective that the FFSBC decided to install the system at all its hatcheries. "The system is now fully installed in three hatcheries," said Billings. "Construction is nearing completion on the fourth, and we are in the design stage on the fifth."

Word of the technology's many benefits has spread quickly beyond the organization's home province. The American Fisheries Society Fish Culture Section recognized the FFSBC's innovation with its Award of Excellence in 2013 for helping to advance the science of fish culture throughout North America. Judging by the number of fisheries organizations that have been in touch with the FFSBC for more information about the system, others seem to agree with the airlift system's merits, including its potential economic benefits.

The FFSBC was recently approached by B.C.-based PR Aqua™ to discuss commercializing the technology. The two firms signed a licensing agreement in April 2014 under which PR Aqua will manufacture, market, sell and service the airlift water reuse system, now branded as **AeroBoost™ Airlift Pumps**.

Freshwater Fisheries Society of BC

Fast FACTS

WINNING EDGE: A MARKETABLE TECHNOLOGY THAT REDUCES WATER AND ENERGY USE AND CONTRIBUTES TO A HEALTHIER ENVIRONMENT FOR YOUNG FISH

- The FFSBC reduced electricity use by 324,390 kWh (30.6 percent) in the first year following the installation of the airlift system.
- Monthly peak electricity demand was reduced 27.6 percent following the installation of the airlift technology.
- Electrical intensity was reduced 26.6 percent in the year following installation.
- BC Hydro contributed 50 percent to the project's total capital cost of $211,775.

CIPEC LEADERSHIP AWARD

ENERGY PERFORMANCE MANAGEMENT

"RtEMIS has helped make energy performance visible at the organization, which is important because it is people, not systems, who manage energy."

NEW GOLD INC. – NEW AFTON MINE

RtEMIS software brings energy conservation to the forefront.

New Gold Inc. – New Afton Mine implemented an energy management information system in 2012 and 2013 with the overarching goals of improving the overall of energy performance in the company and, as a result, significantly improving New Afton Mine's energy performance.

The system that New Afton Mine uses, called RtEMIS (developed by RtTech Software Inc. of New Brunswick), provides staff with regular exposure to detailed visual information about the mine's energy use. This meticulous monitoring of consumption across all of New Afton Mine's activities results in a regular and reliable feedback loop that creates great awareness of the organization's energy performance, including which activities affect performance the most.

"Getting people to interact with the technology is the fundamental thing," mentions Andrew Cooper, New Afton Mine's dedicated energy specialist. "You have this wealth of information to use if you choose to. The trick is to get it to a place where it is visible and people can act on it and make decisions based on what they see."

RtEMIS has provided that visibility for New Afton Mine's staff. Employees can log onto the system and view the organization's use of electricity, natural gas and diesel at a site level, by energy account centre (EAC), by significant energy use (SEU) and at a sub-EAC level. As an example, Cooper points to electrical energy for the grinding circuit. "We can see the energy consumption versus baseline along with the production variable and the cumulative sum (CUSUM) of savings versus the baseline. It is a great deal of information that enables us to make sound decisions about energy use as well as see the impact of energy performance improvements."

RtEMIS monitors energy performance against a baseline

RtEMIS enables New Afton Mine to enter baseline energy performance at a mine, EAC or sub-EAC level and monitor performance against this baseline for each of electricity, diesel and natural gas. The system charts cumulative savings for a period, showing whether the area is performing better or worse than the baseline.

RtEMIS also monitors "overconsumption events." In essence, the system gathers relevant process variables that provide vital information in situations where there is a significant deviation from the mine's baseline energy performance. In addition, RtEMIS provides cost per unit reports, demand reports, overall cost reports and various key performance indicator reports. These charts and reports allow Cooper and other mine personnel to assess energy consumption, make decisions about how best to improve energy performance and assess the impact of their decisions.

"RtEMIS has helped make energy performance visible at the organization, which is important because it is people, not systems, who manage energy," says Cooper.

Complex implementation well worth the effort

RtEMIS works on an OSIsoft® PI system backbone. Before contracting with the RtEMIS vendor, New Afton Mine installed and connected comprehensive metering and submetering. This included 152 electrical submeters (66 existing and 86 new), four new gas meters, two incoming gas pulse hand offs and a diesel fueling system. Cooper's team integrated the meters and collected the data in the PI system "data historian." As Cooper explains, data flows from the meter through the PI system and to the RtEMIS software.

"The process was more complex than we had anticipated but well worth the effort," says Cooper. He cautions any organization considering using similar software to ensure that meters are installed and integrated with the energy data available before calling the vendor in to implement the software solution. "If we had asked a vendor to take care of the work beginning with the metering, our implementation costs would have been much higher."

Cooper said that NRCan's *Energy Management Information Systems Planning Manual and Tool* was indispensable to his learning and the process. "I would advise any organization undertaking such an implementation to start with that product and also take the NRCan Dollars to $ense Energy Management Information Systems workshop based on the book."

Effective solution is just the beginning

RtEMIS has performed well for New Afton Mine. The site's overall energy savings for 2014 as of September were 17 GWh and about 25 GWh in savings were expected by the end of the year.

Importantly, the RtEMIS set the foundation for the successful implementation of ISO 50001 at New Afton Mine. Meanwhile, the full potential of RtEMIS at New Afton Mine has yet to be realized. New Afton could use RtEMIS to help enable month-end financial cost accounting and to simplify month-end energy cost breakdowns by area. In addition, there is great potential to expand RtEMIS across New Gold Inc. facilities, which would enable head office to view either the organization's energy performance as a whole or individual site performance as necessary. Finally, using the existing PI system, notifications can be set up that would enable RtEMIS to advise the relevant department heads and process personnel about significant changes in energy performance.

newgold™ New Afton Mine

Fast FACTS

WINNING EDGE:
A SOFTWARE PROGRAM THAT ENABLES ALL STAFF TO MAKE SOUND DECISIONS ABOUT ENERGY PERFORMANCE IMPROVEMENT

- RtEMIS works on an OSIsoft PI system backbone.
- New Afton Mine expects energy savings of 25 GWh for 2014.
- Implementation has made energy management visible to employees.
- Software guides decision making and helps to optimize energy performance.

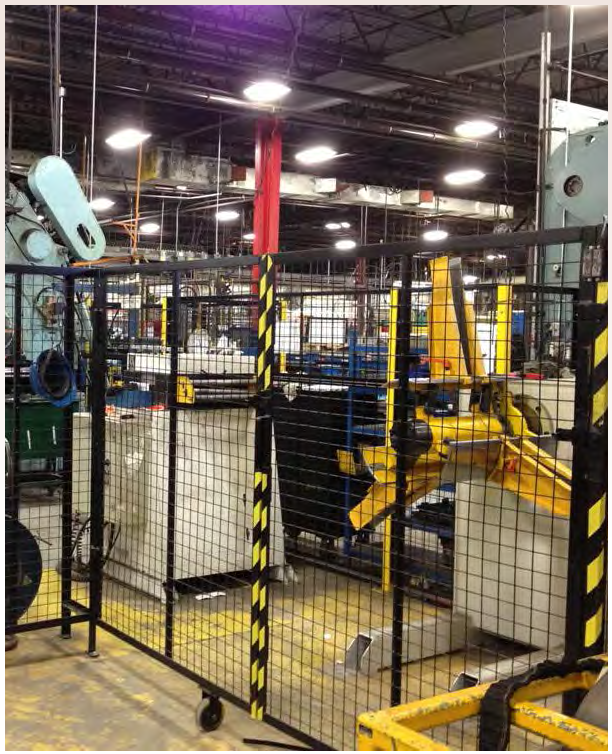
CIPEC LEADERSHIP AWARD

EMPLOYEE AWARENESS AND TRAINING

“The only way to create lasting culture change was to get every single employee to buy in to the new system.”

KI PEMBROKE LP

A comprehensive awareness program makes saving energy second nature.



KI Pembroke LP (KP), has put its faith in the idea that if everyone feels part of the same team, winning the game is a given.

KP is a division of KI, one of the world’s largest manufacturers of office equipment. The company has been a CIPEC Leader since 2007 and is committed to energy efficiency as an overarching corporate objective. But it was in 2012, when KI instituted a new corporate energy policy, that KP got into the game in a more intensive way by launching a full-fledged energy management system (EnMS) and associated employee awareness campaign. By 2013, KP had generated energy savings far beyond its initial goals and an awareness program that now serves as the EnMS’s foundation for success.

“The employee awareness campaign was the game changer,” says Michael Kelly, a manufacturing engineer at KP and the company’s energy champion. “We made sure that the protocols we instituted under our energy management system were mandatory for everyone, from senior managers to the technicians operating machinery on the floor. Then we provided the support they needed to realize savings that we could all appreciate.”

Results far beyond expectations

KP set a target at the outset of the EnMS to reduce its energy consumption by 10 percent. Among its first steps was to establish a detailed improvement plan that identified several conservation projects, including:

- Compressor control upgrades.
- A project to destratify the facility’s air.
- Improvements to the building envelope (in particular, new insulation and weather stripping)

- The installation of variable frequency drives and timers on machinery.
- A plan to re-plumb the process water used to cool welders so it could be reused in downstream paint processes.

The organization works on a two-shift schedule of about 200 employees who fabricate, weld, paint and assemble products. Kelly points out that, at the program's outset, there was a lot of "low-hanging fruit" at KP for conserving energy, including machines being left on and other kinds of unnecessary waste.

KP's goals for training employees included increasing their awareness about the new EnMS, encouraging them to promote energy conservation at all times, even at home, and modelling correct behaviour among higher-ranking staffers so that others would absorb important messages about being vigilant about energy conservation.

"Involving everyone helps ensure there is consistency from top management down to the shop and floor level," says Kelly. "For example, turning off a meeting room light might be a small gesture, but when the floor technicians see management doing that, it reminds them to turn off their machines while they are on a break."

The results of KP's energy management system yielded absolute energy consumption reductions of more than 1.4 GWh of electricity and more than 600,000 m^3 of natural gas. This translates into absolute total reductions of about 27,000 site million British thermal units (MMBTU), 39,000 source MMBTU and 1,300 t of CO_2 equivalent. The absolute water consumption was reduced in 2013 by more than 4.1 million U.S. gallons.

Compared to the 2011–2012 baselines, these savings represent reductions in energy consumption and GHG emissions of more than 30 percent, normalized per million dollars of sales – or three times KP's original goal.

So how did they do it?

KP organized 14 awareness events in 2013 alone. These ranged from a (now annual) event that promotes a variety of energy saving options for the home and office to focused events on lightning or cooling in which the organization would concentrate for several weeks on delivering messages to employees about strategies they could use to reduce KP's energy consumption.

"Every morning our management team huddles about the key performance indicators for the day, week and month," says Kelly. "When we are concentrating on a specific energy saving project, we bring that into the huddle."

In one particularly successful event, Kelly organized a session for employees with KP's local utility suppliers. Hydro One and Enbridge Inc. came in to teach the KP team how they could significantly reduce their electricity bills at home and about incentive programs they could benefit from. "The idea was to get the habits going in the employees' personal lives and have them bring that same mentality into work."

Kelly says that KP has only a limited amount of submetering installed to help with tracking energy use. Without the constant feedback of extensive submetering, involving employees in energy savings is all the more important. "We have set up an atmosphere of friendly competition between different work groups such as assembly lines and paint shops to see who can be the most vigilant with energy conservation."

KI

Furnishing Knowledge®

Fast FACTS

WINNING EDGE:
AN AWARENESS PROGRAM THAT ENABLED THE COMPANY TO TRIPLE ITS ENERGY SAVING GOALS IN THE FIRST YEAR

The program encourages employees to promote energy conservation while at work, at home and within the communities where KI conducts business.

Managers model correct behaviour and employees follow suit.

KP reduced electricity consumption by more than 1.4 GWh in 2013.

CIPEC LEADERSHIP AWARD

INTEGRATED ENERGY MANAGEMENT STRATEGY

"Our resource conservation efforts have worked because senior leaders created a culture of capability that enables everyone in the organization to succeed together as a team."

PEPSICO FOODS CANADA

High expectations lead to high levels of success.

Headquartered in Mississauga, Ont., PepsiCo Foods Canada (PFC) employs more than 5,200 associates united in their vision of Performance with Purpose. At the heart of how PFC does business is this commitment to achieving financial success while ensuring a positive impact on the communities in which they live and work. PFC's commitment to Performance with Purpose is evident in everything they do, including community initiatives, providing clear nutritional information on packaging, using recyclable packaging and growing and developing the best talent, to name just a few. From an environmental sustainability standpoint, PFC has an aggressive conservation policy with specific short- and long-term targets for continuing to achieve business success while also reducing the company's environmental impact.

"Our sustainability and resource conservation program is wide-ranging and draws from global best practices," says Calum MacLeod, Senior Director of Manufacturing, PFC. "Although learning from global best practices is a great way to build a program, we have also leveraged innovative ideas that we have developed internally."

Audacious early goals set the bar high

In 1999, Frito-Lay US set a series of ambitious energy conservation targets that PFC has been working toward ever since: to reduce manufacturing fuel use by 50 percent, electricity use by 50 percent and water use by 75 percent per pound of finished product. The company also strives to continue its journey toward zero landfill; to date, PFC diverts more than 99 percent of its waste from landfill.

To ensure that its sustainability goals could be maintained, PFC also set annual reduction targets for each of its manufacturing facilities. The targets are an average reduction of 5 percent for water, electricity, manufacturing fuel and fleet fuel, translating to an overall carbon footprint reduction of 5 percent per pound of finished product. PFC also set a yearly goal of having all manufacturing and distribution facilities below 1 percent of overall waste going to landfill.

A framework for success

Continuing on its quest to develop sustainable programs, PFC began developing a framework that would ensure success. This included establishing resource conservation teams across the country tasked to actively propel

conservation projects, share best practices and track the success of each energy-saving project. Today, the teams undertake exhaustive audits (based on ISO 14001 principles) that gather specific information about PFC's manufacturing processes and the resource footprints each process leaves.

An important aspect of the conservation framework is PFC's net zero planning where teams are asked to brainstorm creative ways to engineer facilities with the goal of leaving a net zero energy footprint. During this process, all aspects of facility design such as fuel, electricity, water and waste are examined and analyzed to find efficiencies.

"Net zero planning is highly desirable," says MacLeod. "It challenges us to think in innovative ways about how we can make true and lasting change in our facilities."

A range of projects across all operations

In just the past three years, PFC has undertaken dozens of initiatives to conserve energy and reduce its water use and waste production. The following are just a few examples.

Switch fuels – PFC's Kentville, Nova Scotia, site transferred the entire facility from light fuel oil to propane as a step toward changing the facility entirely to compressed natural gas. Since the project was implemented, the site has reduced its CO_2 emissions by about 30 percent per year.

Improve inspection processes – PFC has implemented several comprehensive processes to improve energy efficiency, including detailed inspections of the completeness of the boilers' fuel burn and heat transfer efficiencies. From the inspections, action lists are developed to ensure that boiler systems are producing their maximum yield while consuming the least amount of energy.

Upgrade and optimize HVAC systems – PFC continually upgrades and optimizes all HVAC systems. In 2013, the Cambridge, Ont., site replaced mobile spot-cooling units with four rooftop air-conditioning units and installed higher efficiency exhaust fans to reduce the significant electrical load associated with cooling in the summer months.

"Our sustainability efforts touch on all aspects of, and are supported predominantly by, our supply chain – from raw goods, to finished goods, to the market where they are sold," says MacLeod. "For example, our recycled carton initiative sees the cartons that our products are shipped in reused, on average, between 5 and 10 times each. We also have programs directed at saving water, reducing fuel consumption, improving plant operations, optimizing transportation routes, building design, system efficiencies and infrastructure design, just to name a few. All are driven through technology, people and processes."

Solid results

As of January 2013, PFC had made impressive progress toward its audacious goals. Since 1999, it has reduced the per-pound use of fuel in its manufacturing facilities by more than 25 percent (1,000 BTU/lb.); electricity by 20 percent (0.04 kWh); and water consumption by 40 percent. It has also reached its landfill reduction goal, having diverted more than 99 percent of total waste.

MacLeod says the program has succeeded largely because of focused alignment and environmental stewardship by associates at all levels. One example of this is that area directors meet regularly to evaluate and plan environmental objectives and set metrics to communicate to their teams. These metrics are reviewed frequently by associates at all levels to ensure progress is being made toward PFC's sustainability goals.

"These goals would not have been realized without the hard work of our associates across the country," says MacLeod. "Our resource conservation efforts have worked because we set high expectations at the senior level and then enabled everyone in the company to succeed by providing them with the right training and tools."

CIPEC LEADERSHIP AWARD

INTEGRATED ENERGY EFFICIENCY STRATEGY

BARRICK GOLD-HEMLO

Employee awareness and a strong corporate culture are keys to success.

"Once we focused on the whole site instead of individual projects, we began to see real culture change."

Barrick Gold-Hemlo is a mining operation in northwestern Ontario that, for decades, has been conscious of energy conservation. In 2011, when the organization underwent ISO 14001 certification and began to participate in the Northern Industrial Electricity Rebate (NIER) program, Barrick Gold-Hemlo made a concerted effort to launch an integrated energy management program and began to see significant savings across the organization.

"For us, success with energy management has been a long journey," says General Manager Andrew Baumen. "It has been part of a continuous improvement strategy that has depended on a lot of people's energy and corporate alignment with some very specific objectives." He says that once Barrick Gold-Hemlo focused on the whole site instead of smaller, individual energy saving projects, the company began to see real culture change, which translated into impressive energy savings."

Savings across all energy sources

Barrick Gold-Hemlo consumes energy from four sources: electricity (59.7 percent), diesel (24.9 percent), propane (14.9 percent) and gasoline (0.5 percent). The company's integrated energy efficiency strategy includes an energy reduction target, a communication plan, training and capability building, and a list of projects implemented to reduce the consumption, costs and GHG emissions produced by all four energy sources.

Barrick Gold-Hemlo focuses on projects that have tangible value to the company – such as health and safety improvements, production improvements, and greater efficiency overall. To date, Barrick Gold-Hemlo's integrated energy management strategy has generated millions of dollars in savings across the mine site without affecting productivity.

Baumen says three projects over the past year stand out as examples of the company's success: an upgrade to the underground compressor system, the completion of phase

one of a ventilation on demand project in the underground operations and the introduction of several variable frequency drive water pumps in the mill.

"Those projects alone will reduce our energy consumption by 7,000 MWh per year, which will translate into an $800,000 saving for Barrick Gold-Hemlo," he says. "They delivered huge value to the operation and the best part is that they will continue to pay back year after year." Meanwhile, the total cost savings to the company as a result of its energy management activities are $5.7 million per year.

A dedicated energy management coordinator

Key to Barrick Gold-Hemlo's integrated energy management program was the appointment in 2011 of a dedicated energy management coordinator. The coordinator works closely with the company's energy management committee to prioritize and select from among 60 proposed projects, ensuring that the actions taken are practical and will yield the most significant energy savings and operational benefits. Under the guidance of the coordinator, 10 projects have been implemented, with more underway.

"A dedicated energy champion is one of the keys to a successful program," says Baumen. "Without one, the program gets diluted in the business of people's day-to-day jobs." He says the coordinator acts as project manager, helping support operations and maintenance crews in their implementation of the energy management projects.

Also important to the company's success in energy conservation have been two sources of funding since May 2011: $15 million from the NIER program and $380,000 from Ontario Power Authority's (OPA) Industrial Accelerator Program. OPA is now known as the Independent Electricity System Operator (IESO).

Ensuring the right systems for monitoring success

Another key to success is continual improvement on the equipment side. Barrick Gold-Hemlo upgrades its systems regularly for monitoring energy consumption and the resulting cost savings. Recently, it upgraded its analog electrical meters to ION meters and then upgraded monitoring software for the ION meters. A current corporate initiative may implement a PI system, which can be used to monitor and track process and energy effectively.

"As the saying goes, you cannot manage what you cannot measure," says Baumen. "Monitoring is obviously very important for determining whether your strategy is working. It is a feedback loop about your original goals and objectives and whether they have met the design requirements."

Deeply embedded energy awareness

Regular energy awareness meetings are another important feature of Barrick Gold-Hemlo's approach. The energy management committee meets weekly and reports quarterly to all departments to update them on new projects and overall successes and goals. Once a year, the organization conducts a high-level management meeting to review the entire energy management plan and set priorities for the upcoming year. A monthly environmental and energy awareness newsletter called *The Green Sheet* provides staff with updates on the company's progress on significant environmental impacts that include energy consumption and GHGs.

"We make sure that we recognize the people creating success in our projects," says Baumen. "It is all part of demonstrating that energy conservation is a priority across the organization." Baumen stresses that making safety an explicit priority is also important for creating a positive culture for energy conservation.

BARRICK
HEMLO

Fast FACTS

WINNING EDGE: A COMPANY-WIDE ENERGY CONSERVATION SCHEME THAT IDENTIFIES 10,000 MWh PER YEAR IN ENERGY SAVINGS

Savings increase the company's funds by $5.7 million per year.

Regular equipment and software upgrades are key features of success.

Safety and employee comfort are priorities.

CIPEC LEADERSHIP AWARD

CIPEC FUTURE LEADERS

ANTONY HILLIARD

The Parameter Estimates method leverages CUSUM charts to yield valuable information.

Antony Hilliard has developed an innovative energy diagnosis tool that will help managers and workers develop "next level" energy awareness about their buildings.

Called the Parameter Estimates visualization method, Hilliard developed this low-cost, general-purpose innovation in the course of his doctoral studies at the University of Toronto (Industrial Engineering). His work is supported financially by Energent Incorporated and the Natural Sciences and Engineering Research Council of Canada.

The Parameter Estimates visualization method is a statistical model that complements the CUSUM charts widely used by building portfolio managers as part of their energy efficiency and energy tracking activities. Standard CUSUM charts have been used since the 1980s to show building managers when and how much energy consumption occurs. But used alone, Hilliard explains, they are not very useful in helping people track down which building processes are performing best (or worst) or why performance changes are occurring.

"Essentially, the Parameter Estimates visualization method allows you to take a more granular look at your building's energy consumption," he says. "It is like taking the CUSUM charts, which show you only whether you are doing better or worse overall on consumption, and drilling down into them so you can pinpoint which energy drivers are affecting your performance most." What this means is that building managers can narrow their search for energy consumption problems according to business areas, such as a particular step in the manufacturing process or an underperforming HVAC system.

Moving beyond CUSUM charts can motivate teams

As another example of where confusion arises when using only CUSUM charts, Hilliard explains that it can be hard for

"This method can support an organization's culture of energy awareness by providing a reality check that helps people learn."

building managers to diagnose whether their energy savings (or losses) are resulting from deliberate actions they have taken to improve a manufacturing process or technology or are from other more mysterious, unmeasured factors. If workers and managers can more clearly distinguish the results of their efforts, they may be more motivated to make further improvements to their business processes.

Also, once managers have a deep understanding of why their energy costs are not fixed, says Hilliard, and start closely tracking business energy performance, a greater energy awareness can begin to develop within an organization. "This method can support an organization's culture of energy awareness by providing a reality check that helps people learn."

Hilliard uses a retail analogy to help explain how the method helps building managers. "Imagine you are at a supermarket but there is no price tag on anything. You would have to infer after getting the bill what the price of milk might have been." The analogy with CUSUM charts is that they tell you only if you are saving or overspending, he says. With Parameter Estimates, energy managers can move closer to a situation in which they can judge changes in the energy prices they pay for the processes they run and the products they make.

Potential for cost savings

Although Hilliard's visualization model is not yet commercially available, he expects its application will be less expensive than the more conventional alternative of submetering. Submetering can cost tens of thousands of dollars to install, he says, which exposes energy projects to greater risk. Building managers can find themselves in a position where they require an extraordinary amount of energy savings to justify the cost.

"Using a statistical method like this one is beneficial because it is unobtrusive and is likely to be relatively affordable. Although, it is too early to speculate very closely on the precise cost of a product," says Hilliard.

Just the beginning

Hilliard continues to develop the Parameter Estimates visualization method. In late 2014, he concluded an experiment using college students from Ontario building science and energy technology programs to evaluate how different energy performance changes – such as changes to baseload or heating sensitivity – are detected and diagnosed by novice energy managers. The students were asked to complete an energy monitoring and targeting task by using either CUSUM charts alone or CUSUM charts in conjunction with Parameter Estimates charts.

The findings support the value of the Parameter Estimates visualization method. When students used CUSUM charts alone, they were accurate as often as they would have been if they had guessed at the correct answers (in this experiment, 25 percent of the time). When they used the Parameter Estimates method in conjunction with CUSUM charts, their success rate rose to 40 percent.

"It is not a magic bullet, but 40 percent was a pretty significant improvement over chance," says Hilliard. He says the next step is to test the usefulness of Parameter Estimates charts in a wide range of real work settings. He hopes to interest industry or government partners in building Parameter Estimates charts into freely available EMIS tools (such as a Microsoft® Excel® template) and incorporating it into energy monitoring training workshops.

In 2014, Hilliard presented his work at the American Council for an Energy-Efficient Economy's Summer Study on Energy Efficiency in Industry. The model has also been integrated into Energent's internal energy management information system product.

Hilliard was scheduled to complete his PhD by the end of 2014.

Fast FACTS

WINNING EDGE: A STATISTICAL MODEL THAT BRINGS GREATER BENEFITS TO STANDARD CUSUM CHARTS

- The Parameter Estimates visualization method drills down into CUSUM charts for greater clarity.
- Re-using existing statistical models provides a cost-effective solution.
- A complex method has been shown to be user-friendly.
- A product offering is being developed by Energent Inc.

CIPEC LEADERSHIP AWARD

CIPEC FUTURE LEADERS

ANDRE PELLETIER

Enzyme process enables pulp mills to produce high-quality product using less energy.

A PhD candidate from the University of New Brunswick is working to modernize the mechanical pulping industry so that it uses far less energy, creates higher yields and becomes less polluting in the process.

Andre Pelletier began a research project in 2010 to develop a new enzyme formulation and process that would lower energy consumption in mechanical pulp refining without compromising the quality of the resulting pulp and paper. In 2013 he completed the first phase of his research and has published two papers and a third is on the way.

"We are trying to figure out how to get enzymes to penetrate wood chips more effectively than in the past," says Pelletier. "The immediate advantages are reduced energy consumption and a less toxic process, but down the road we expect that precise enzyme formulations will also improve yields in the pulping industry."

An evolving industry

The pulp and paper industry uses several methods to produce its end products. Straight mechanical pulping, which uses neither enzymes nor chemicals, is a relatively simple process that produces a fragile end product. Chemi-mechanical pulping, in which wood chips are treated with chemicals before they undergo the mechanical phase, improves the surface chemistry of pulp fibres so that the end product is stronger and of a higher quality. This is the process most commonly used in today's industry. Enzyme pulping, if done well, can mimic the surface chemistry improvements that chemical pulping produces while delivering higher pulp yields and protecting the environment.

As Pelletier explains it, chemical pulping is more straightforward than enzyme pulping, which is why the latter process is still under experimentation. "We are working to solve a mass transfer problem," he says. "In traditional chemical pulping, the chemicals penetrate easily into the porous wood chips. Enzymes, which are orders of magnitude larger than

"By bringing this work into the lab, we can remove much of the uncertainty before a large trial goes ahead at a mill."

chemicals, face greater barriers to penetration." Pelletier says his work involves engineering new enzymes that are smaller and discovering which combinations of enzymes or "enzyme cocktails" work best. Recent innovations in genetics and bio-reactors allow for more efficient enzyme production.

A particular challenge with devising enzyme cocktails is that a unique mixture is needed for each species of wood. Pelletier says that, in the past, research teams at mills have mixed enzymes based on educated guesses and then hoped for a good outcome. "Pilot testing is expensive when it is hit and miss," he says. "By bringing this work into the lab, we can remove much of the uncertainty before a large trial goes ahead at a mill." Pelletier's team is also working to establish formulations that allow for easy adaptation to other facilities, meaning that costly, capital-intensive process modifications can be avoided.

Saving energy while protecting the environment

Pelletier says the energy-saving component of his work relates to the mechanical phase of the pulping process in which wood pulp is processed in large grinders. "Some of these giant motors are 30 MW, which uses an immense amount of power," he says. "What we are doing is using enzymes to soften those wood chips and make it easier for the motors to break them apart."

He adds that while chemicals can produce effects similar to enzymes, they are more dangerous to use because they can be toxic. The relative safety of enzymes, which are usually biodegradable, makes an industry migration toward enzymes desirable. "If you have an enzyme spill, there is less risk to the environment, whereas a chemical spill can have significant risks," says Pelletier.

The genetic modifications of the enzymes Pelletier uses have the added benefit of requiring less energy to produce than the chemicals traditionally used in mechanical and chemi-mechanical pulping processes. These same modifications also mean that effluents are easier to treat. As Pelletier explains, enzymes are protein-based, which means that the biological-based effluent treatments used in the pulp and paper industry function better with enzymes than with chemicals. "The microorganisms that 'clean' the effluents actually need, to some degree, the elements found in proteins to function properly."

Impressive results in the lab

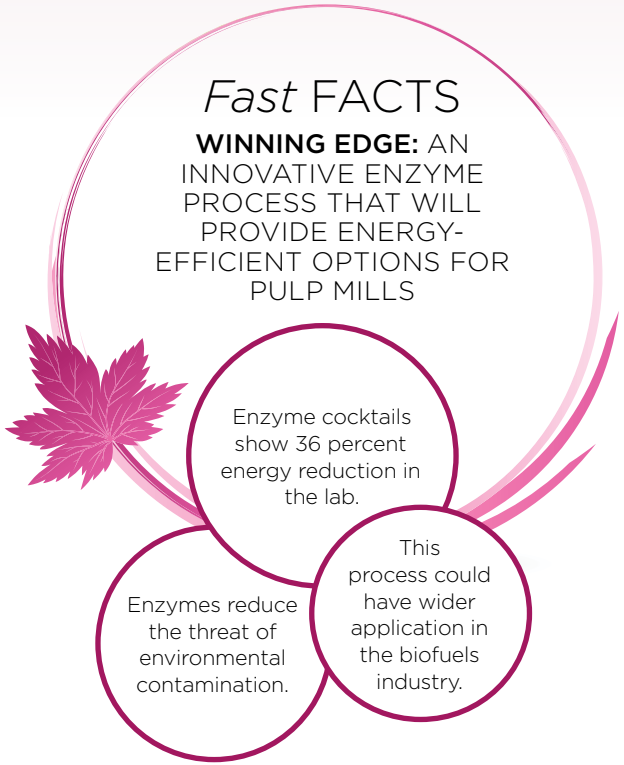
According to Pelletier's published results in small-scale testing, his enzyme formulations have the potential to save up to 36 percent of the energy needed to produce pulp suitable for specific paper grades.

When the process was tested in a small-scale mill trial, it produced only a 5 percent energy saving. But Pelletier is nevertheless optimistic about the process. "There are always glitches going into a mill, as we are working with tonnes of wood chips per hour rather than kilograms per hour. We have to optimize the refiner's operations to match our process." In late 2014, Pelletier was working with industrial partners to plan more extensive trials.

A process with a bright future

Pelletier sees plenty of potential for these enzymes in his group's other research area: biofuels. He says his group is working on developing a chemi-mechanical downsizing pre-treatment to improve lignocellulosic biofuel yields. Eventually, the group aims to replace the chemicals used routinely in these processes with highly efficient enzyme formulations.

"The pre-treatment step in second-generation biofuel production from lignocellulosic feedstocks is currently one of the biggest hurdles in bringing this type of technology to the market," says Pelletier. "By lowering the energy costs in the pre-treatment processes, similar to what we are doing in mechanical refining, we are hoping to overcome that hurdle."



ISO 50001

ENERGY MANAGEMENT SYSTEMS STANDARD

Published in June 2011, the ISO 50001 Energy Management Systems standard establishes an energy management framework for all types of organizations and companies. The voluntary standard could quickly become a de facto requirement for businesses competing in today's globalized world. Therefore, an increasing number of Canadian organizations are seeking ISO 50001 certification given the multiple economic and environmental benefits to be gained.

ISO 50001 follows the Plan-Do-Check-Act cycle for continual improvement of the energy management system. It enables organizations to integrate energy management into their other initiatives to improve quality, environmental performance and other management systems.

The standard is the product of the collaborative work of many countries striving to improve energy management. Canada helped develop the standard and continues to be involved in other global energy initiatives such as the Clean Energy Ministerial (CEM), which is a global forum to share best practices and programs that encourage and facilitate the transition to clean energy.

The Energy Management Working Group (EMWG), identifies best practices, creates and disseminates resources, and offers technical expertise to support efforts to promote energy management.

EMWG published four Canadian case studies – about Lincoln Electric, IBM Bromont, New Gold New Afton Mine and Chrysler Brampton – to illustrate the benefits of ISO certification. In addition, CEM website provides several ISO 50001 case studies from other countries that cover a variety of industrial sectors.

Currently, 14 organizations in Canada are certified to ISO 50001, while several others are in the process of implementing the standard. Organizations have reduced their annual energy consumption by as much as 22 percent in the initial years after becoming certified.

Initiatives are being undertaken to improve the Canadian support for organizations implementing energy management systems. The Standards Council of Canada and NRCan are working to develop an ISO 50001 auditor certification protocol to develop professional skills needed to conduct high-quality audits. The Canadian Mirror Committee, which includes representatives from industry, government, consultants and special interest groups, has developed an energy management strategy plan to promote the uptake of energy management to industry.

To encourage and support ISO 50001, NRCan offers cost-shared assistance for organizations implementing the standard.

Energy Efficiency Programs and Tools for Industry

NRCan offers several energy efficiency and renewable energy programs and services to meet the needs of Canadian industry.

NETWORKING OPPORTUNITIES

- Canadian Industry Program for Energy Conservation (CIPEC)

ENERGY MANAGEMENT TRAINING SERVICES

- Dollars to $ense Energy Management workshops
- free webinars
- PI training workshops

DOLLARS TO $ENSE ENERGY MANAGEMENT WORKSHOPS

Hundreds of organizations have reduced operating costs by adopting energy-saving practices offered through the Dollars to $ense Energy Management workshops. The workshops are facilitated by leading experts in energy efficiency and give owners, managers and operators of industrial facilities a competitive edge in managing energy costs.

THE SIX ONE-DAY DOLLARS TO $ENSE WORKSHOPS ARE

- Energy Management Planning – how to plan ahead to realize the benefits of energy management
- Spot the Energy Savings Opportunities – shows how to identify, and capitalize on, immediate savings opportunities through practical exercises and hands-on demonstrations
- Energy Efficiency Financing – improves awareness of financing options and skills in obtaining financing for energy efficiency projects
- Energy Monitoring – shows companies how to measure and analyze energy use
- Energy Management Information Systems (EMIS) – makes energy performance visible and helps organizations apply a systematic approach to energy efficiency
- ISO 50001 Energy Management Systems standard – explains ISO 50001 implementation

The workshops can be customized to meet the needs of industrial sector organizations and companies. Professional instructors will consult with the company to identify specific requirements and then assemble the information and resource materials for the target audience.

Contact NRCan to find out more about workshops.

Email: Dollarsto$enseworkshops@nrcan-rncan.gc.ca.

WEBINARS

Webinars are free online workshops for CIPEC Leaders that feature real-world examples.

Topics include the ISO 50001 Energy Management Systems standard, EMIS, motor systems management, compressed air, boiler efficiency and more. Webinars are offered monthly.

For more information, send an email to info.ind@nrcan-rncan.gc.ca.

PROCESS INTEGRATION TRAINING WORKSHOPS

The PI workshop covers topics such as:

- The steps necessary for a successful PI study, from plant data collection to project definition.
- Energy performance assessment.
- Waste heat recovery from utility systems.
- Pinch analysis concepts to analyze and optimize the use of industrial process heat.

In addition to hands-on training, each participant has the opportunity to use and receive a copy of the INTEGRATION software developed by CanmetENERGY.

For more information, send an email to info.ind@nrcan-rncan.gc.ca.

FINANCIAL SUPPORT

- cost-shared assistance: for ISO 50001 implementation pilots, energy assessments and other energy management projects

- tax savings: Classes 29, 43.1, and 43.2 and Canadian Renewable and Conservation Expenses (CRCE) tax savings program

COST-SHARED ASSISTANCE

CIPEC members can leverage CIPEC resources to implement ISO 50001. The ecoENERGY Efficiency for Industry program is offering cost-shared assistance to industrial companies to perform ISO 50001 implementation pilots, energy assessments and other energy management projects.

NRCan will provide up to 50 percent of the cost, to a maximum of $40,000, for

- ISO 50001 Energy Management Systems standard implementation pilots
- process integration studies
- computational fluid dynamics studies
- energy management projects

To be eligible, a company must have written approval of its technical proposal from NRCan before beginning the project.

For more information on the ISO 50001 Energy Management System standard, visit nrcan.gc.ca/energy/efficiency/industry/cipec/5379.

Or send an email to info.ind@nrcan-rncan.gc.ca.

CLASSES 29, 43.1, AND 43.2 AND CRCE TAX SAVINGS

For a limited time, companies that invest in manufacturing and processing equipment may take advantage of Class 29 in Schedule II of the *Income Tax Regulations* (the Regulations). This tax incentive allows for the capital costs of certain manufacturing and processing equipment that would otherwise qualify for 30 percent per year capital cost allowance (CCA) on a declining balance basis under Class 43 to be written-off at 50 percent per year on a straight-line basis under Class 29. This incentive is available for equipment acquired after March 18, 2007, and before 2016.

Companies that invest in clean energy generation and energy conservation equipment such as cogeneration systems, photovoltaic panels, wind turbines and bio-fuel production equipment may be able to write-off the capital costs of such equipment at accelerated CCA rates under Class 43.1 or 43.2 in the Regulations.

Under Class 43.1 or 43.2, the capital costs of qualifying equipment can be written-off at 30 or 50 percent per year, respectively, on a declining balance basis. Without these accelerated write-offs, many of these assets would be depreciated at annual rates of between 4 and 30 percent.

The eligibility requirements for Class 43.1 and 43.2 are generally the same, except that for Class 43.2, equipment must be acquired after February 22, 2005, and before 2020 to be eligible, and fossil-fuel cogeneration equipment must meet a higher efficiency standard to qualify.

NRCan is the technical authority for Classes 43.1 and 43.2. Further information on what equipment qualifies for Class 43.1 or 43.2 is in the *Technical Guide to Class 43.1 and 43.2*.

In addition to Class 43.1 or Class 43.2 CCA, the Regulations allow expenses incurred during the development and start-up of renewable energy and energy conservation projects to be handled in several ways. CRCEs can be fully deducted in the year incurred, carried forward and deducted in future years, or financed through flow-through shares. Further information on the project expenses that qualify as CRCE is provided in the *Technical Guide to Canadian Renewable and Conservation Expenses (CRCE)*.

To qualify as CRCE, expenses must be incurred for a project in which it is reasonable to expect at least 50 percent of the capital costs incurred would be capital costs for equipment that is described in Class 43.1 or Class 43.2.

For more information on tax savings for industry, visit nrcan.gc.ca/energy/efficiency/industry/financial-assistance/5147.

TECHNICAL SUPPORT

- Canadian Industry Program for Energy Conservation (CIPEC)
- technical guides, benchmark studies and tools

ISO 50001 – ENERGY MANAGEMENT SYSTEMS STANDARD

Published in June 2011, the ISO 50001 Energy Management Systems standard establishes an energy management framework for all types of organizations and companies. This voluntary standard could quickly become a de facto requirement for businesses competing in today's globalized world.

ISO 50001 IMPLEMENTATION WILL:

- Help organizations make better use of their existing energy-consuming assets.
- Create transparency and facilitate communication about the management of energy resources and the promotion of energy efficiency throughout the supply chain.
- Lead to significant reductions in energy costs, GHG emissions and other environmental impacts.
- Promote energy management best practices and reinforce good energy management behaviours.
- Help facilities evaluate and prioritize the implementation of new energy-efficient technologies.
- Allow integration with other organizational management systems, such as environmental and health and safety systems. It is compatible with other performance improvement approaches (Superior Energy Performance®, Lean, Theory of Constraints, Six Sigma, 5S, etc.) and energy management systems.

ENERGY MANAGEMENT INFORMATION SYSTEMS – PLANNING MANUAL AND TOOL

The Energy Management Information Systems tool makes energy performance visible to different levels of the organization so that actions can be taken to create financial value for the company. The tool is also a performance management system that helps reduce energy consumption and cost.

For more information on the *Energy Management Information Systems – Planning Manual and Tool*, visit nrcan.gc.ca/energy/efficiency/industry/cipec/5223.

Or send an email to info.ind@nrcan-rncan.gc.ca.

The Year in Review

CIPEC members continued to make advances in energy efficiency during the past year. These impressive gains were realized thanks to strong leadership and dedication from the CIPEC Executive Board, the Task Force Council and the 21 task forces, together with support from the Office of Energy Efficiency.

CIPEC Leaders that were certified to the ISO 50001 Energy Management System standard include 3M Canada Company (London); Catalyst Paper (Crofton), CpK Interior Products (Port Hope), Fiat Chrysler Canada Inc. (Etobicoke and Windsor) and IBM Canada (C2MI).

The number of CIPEC Leaders rose to more than 2,400.

Dollars to $ense Energy Management workshops were delivered to more than 3,220 people, bringing the total to more than 30,000 attendees since the workshops were first offered in 1997.

More than 925 people attended 15 CIPEC webinars. Since the first webinar in 2011, more than 2,350 people have attended 30 webinars.

CIPEC's estimated annual energy savings exceeded 1.65 PJ.

CIPEC's estimated reductions in annual GHG emissions totalled 0.17 Mt.

Industry Sector Profiles

Accurate measurement and meaningful data is fundamental to measuring energy improvements. Data used in this annual report are collected by Statistics Canada, with funding from NRCan and Environment Canada, and supplemented by information received from associations that participate in the Canadian Industry Program for Energy Conservation, as well as other private and government organizations. The data represents entire industrial sectors, not just CIPEC members.

Statistics Canada data for the manufacturing sector is collected through the annual Industrial Consumption of Energy (ICE) survey, which covers about 4,300 establishments in the manufacturing sector. For each establishment, the survey gathers information on energy fuel consumption for 13 fuels. Survey results are used to track energy efficiency improvements, calculate CO_2 emissions and inform Canadians about energy conservation.

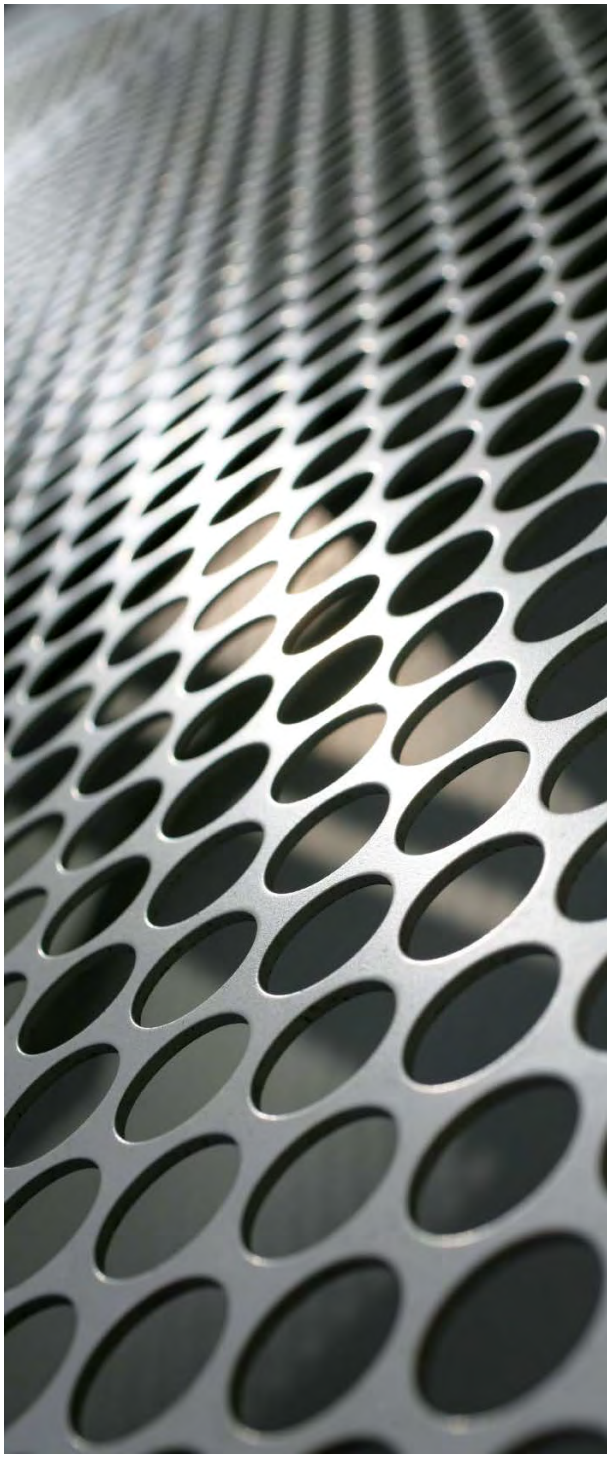
Statistics Canada began streamlining the questionnaire and data collection process in 2004. The changes included standardizing some special industry questionnaires, making provisions for respondents to explain any major changes in energy consumption and thus minimize follow-up inquiries, and converting fuels to a standard unit of measure. Data analysis and interpretation involves the collective effort of NRCan's OEE, CIPEC trade associations and the Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC) at Simon Fraser University in Burnaby, B.C. The CIEEDAC produces energy intensity indicators for each sector based on production and GDP.

Much of the ICE data is available online. Statistics Canada data is published in CANSIM Table 128-0005 – Energy fuel consumption of manufacturing industries in natural units, using the North American Industry Classification System (NAICS) and CANSIM Table 128-0006 – Energy fuel consumption of manufacturing industries in gigajoules, also using the NAICS.

For more information, see the Statistics Canada website at www.statscan.ca.

The OEE publishes *Energy Efficiency Trends in Canada* annually at oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/publications.cfm.

Data from the CIEEDAC is available at www2.cieedac.sfu.ca/index.html.



Aluminum

PROFILE

The aluminum sector comprises companies engaged primarily in extracting alumina from bauxite ore, producing aluminum from alumina, refining aluminum by any process, and rolling, drawing, casting, extruding and alloying aluminum and aluminum-based alloy basic shapes. Canada's aluminum sector is ranked fourth in the world in annual primary aluminum production after the United States, Russia and China and is the second-largest exporting country after Russia. The combined output of the aluminum plants in Canada is a major contributor to Canada's national and local economies. There are eight aluminum smelters in Quebec and one in British Columbia. Arvida, Quebec, hosts an alumina refining site, while coke calcination plants are located in Arvida and in Kitimat and Strathcona, B.C.

ACHIEVEMENTS

Canadian aluminum manufacturers are members of CIPEC through the Aluminium Association of Canada, and continue to adopt measures to promote increased energy efficiency. For example, an increasing number of manufacturers have installed control systems that allow for constant monitoring of energy performance. Additionally, various companies have struck partnerships to purchase the vapour produced from each other's waste heat. This initiative translates to an annual reduction in GHGs of 40,000 t as well as a decrease in the long-term costs of energy procurement.

Industry wide, companies continue to identify and adopt best practices that enable them to conserve more energy and reduce waste. Waste-reduction initiatives include automating compressed-air dryer systems, modifying the cycle times of compressed-air equipment and improving air-leakage detection. More broadly, companies are taking measures to reduce

tank consumption, optimize burner controls for pouring furnaces and improve the use of alternatives to natural gas.

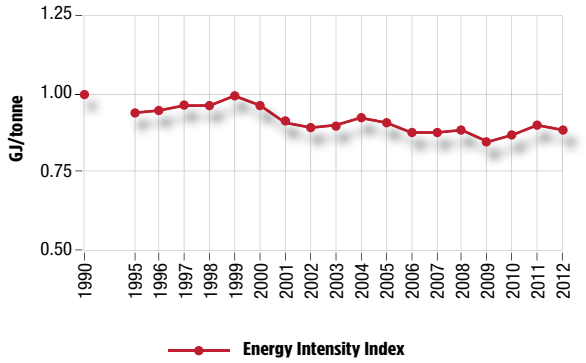
Finally, companies are increasingly holding awareness activities to ensure employees are informed and educated about the impacts of their operations on energy consumption.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5255.

HIGHLIGHTS

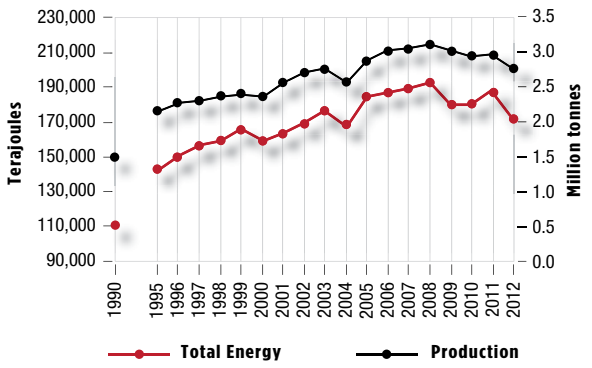
Aluminum Sector – NAICS 331313

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



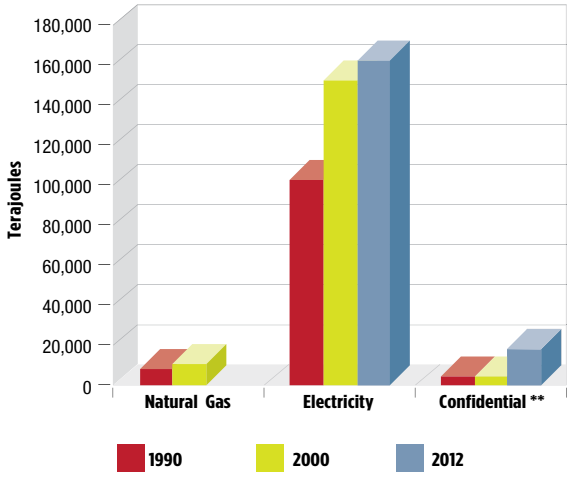
Energy intensity decreased by 1.6 percent between 2011 and 2012.

Total Energy and Physical Output (1990-2012)



Between 2011 and 2012, total energy consumption decreased by 8.4 percent while total production decreased by 6.9 percent.

Energy Sources



** Confidential includes heavy fuel oil, middle distillates, natural gas and propane.

Electricity consumption decreased by 7.9 percent between 2011 and 2012.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – Natural Resources Canada, *Production of Canada's Leading Minerals – Table 12*. January 2014.

Brewery

PROFILE

The Canadian brewery industry includes about 371 licensed breweries, which is an increase of 40 percent over the past five years. Economic activity in the beer economy accounts for 0.9 percent of Canada's GDP and a combined $5.8 billion in federal, provincial and municipal tax revenues.[1]

Mergers and acquisitions, along with the establishment of microbreweries and craft breweries, have changed the industry in recent years. According to Statistics Canada's Canadian Business Patterns database, large firms often employ more than 500 workers at a single establishment, while small microbreweries employ fewer than 50 people. The production, marketing, distribution and sale of Canadian beer generate more than 163,200 jobs.

Energy and utility costs typically represent 3 to 8 percent of a brewery's expenditures. Between 1990 and 2012, the average amount of energy Canadian brewers consumed to produce 100 L of beer declined by 58 percent.

ACHIEVEMENTS

The Canadian brewing industry has an excellent environmental record that is based in part on a range of activities dedicated to reducing energy use and GHG emissions over the past two decades.

Growth leads to greater efficiency

Les Brasseurs du Nord (Boréale), a brewery located in Blainville, Quebec, was the first in Canada to convert its entire vehicle fleet to hybrid power. The company expanded its operations between 2006 and 2009 when it added about 2,323 m^2 of warehousing and production space. Since then, the company has further demonstrated its commitment to energy efficiency in a variety of projects. These projects include installing a solar wall that passively heats incoming air; introducing a non-traditional geothermal system that uses cool groundwater to support the plant's air conditioning and dehumidification processes (and that returns the water to the ground uncontaminated); and installing a customized central control for the plant's HVAC system.

As a result of these innovations, the new, larger plant actually uses less energy than its predecessor.

[1] beercanada.com/economic-impact-beer

Employee contributions make a difference

Saint John, N.B.'s Moosehead Breweries Limited has taken a different approach to energy conservation. Although the company maintains an extensive energy efficiency program, management is always mindful of the need for improvement. The company has adopted an employee awareness initiative that asks staff to participate in energy conservation. Even contributions as seemingly small as turning off lights that are needlessly left on add up to significant savings. Over nearly 15 years, this and other initiatives have combined to enable the brewery to save more than 236 terajoules (TJ) of energy – enough to run operations for one and a half years.

Clean energy from wastewater treatment

The Molson Coors Brewing Company is the seventh-largest brewer in the world by volume. The company launched its 2020 Sustainability Strategy in 2013 as a way of setting goals for the management of energy, GHG emissions, water use and solid waste generation. One of the principal goals of the strategy is to invest in, and generate clean energy from, wastewater treatment. The company has introduced anaerobic digestion wastewater treatment technology to bring its wastewater to a high quality and generate biogas that it can convert into heat or electric energy. Molson Coors currently uses anaerobic digestion technology at five sites worldwide, including in Canada, and invested $11.8 million on two additional projects in 2014. More such projects are planned for 2015.

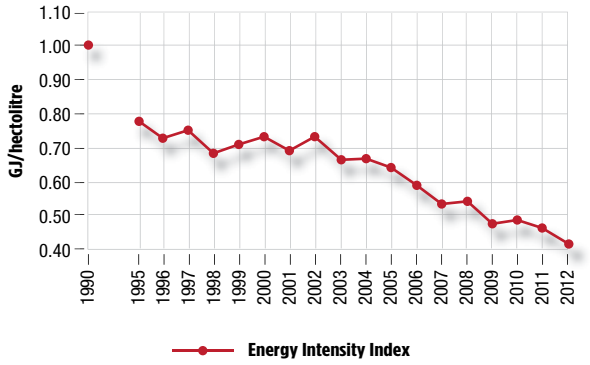
By 2020, the company plans to improve water efficiency by 15 percent, improve energy efficiency by 25 percent, reduce carbon intensity by 15 percent and send no waste to landfills.

For more information on the sector, visit oee.nrcan.gc.ca/industrial/opportunities/cipec/meetings/brew/login.cfm.

HIGHLIGHTS

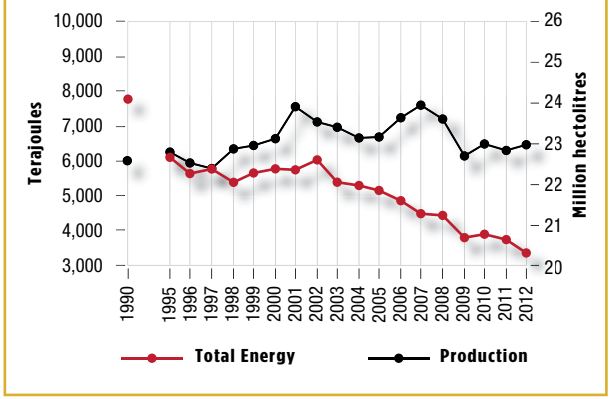
Brewery Sector – NAICS 31212

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



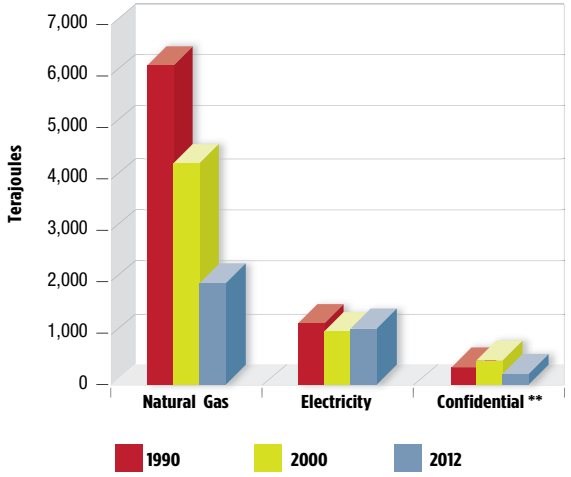
Energy intensity decreased by 10.4 percent between 2011 and 2012.

Total Energy and Physical Output (1990-2012)



Between 2011 and 2012, total energy consumption decreased by 9.9 percent, and total production increased by 0.6 percent.

Energy Sources



** Confidential includes propane, fuel oil, steam and middle distillates.

Natural gas consumption decreased by 17.7 percent while electricity consumption increased by 9.5 percent between 2011 and 2012.

Data source

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Cement

PROFILE

A key player in Canada's construction sector, the cement industry provides a reliable material essential to building and maintaining the country's communities and critical infrastructure. The cement industry contributes more than $8 billion and 27,000 direct and indirect jobs to the Canadian economy.

In 2013, Canada's eight cement companies operated 15 processing facilities across the country and produced more than 11.8 million t of cement. Energy accounts for about 40 percent of total input costs in the manufacturing process. During the past decade, the industry has increased its energy efficiency by 11 percent and continues to aggressively pursue strategies to reduce its reliance on the use of fossil fuels.[2]

ACHIEVEMENTS

Energy consumption across the Canadian cement industry is trending downward. A report issued by the U.S.-based Portland Cement Association, which studies trends for the American and Canadian cement industries, shows that industry energy consumption decreased in 2012. That finding supports another made in the Cement Association of Canada's 2012 *Environmental Performance Report*, which shows a downward trend in average cement CO_2 intensity. This latter trend is partially due to the industry's conversion to lower-carbon Contempra cement, increased use of supplementary cementitious material and greater use of low carbon fuels in cement manufacturing. Additionally, air emissions (e.g. nitrogen oxide, sulphur oxide and particulate matter) have been relatively stable or on a general decline since 2002.

The industry has also taken great strides in reducing its thermal and electrical energy use over the past 10 years. Since 2007 in particular, efficiency in these areas has increased by 11 percent. More broadly, companies across the industry are adopting ISO 50001 certification, and are introducing such process changes as controlling the quality of their raw mixes, optimizing fuel mixes, managing kiln

[2] Cement Association of Canada

efficiencies, investing in heat recovery systems and optimizing the use of compressed air.

Tackling multiple projects for combined savings

Holcim (Canada) Inc. is one Canadian cement industry company that has embraced energy efficiency. It is one of the largest vertically integrated building materials and construction companies in Canada, employing more than 3,000 people and manufacturing cement, aggregates and ready-mixed concrete. Between 2010 and 2011, and as part of a pilot project launched by Ontario Power Authority (OPA), now IESO, and Enersource, Holcim's energy manager identified 10 projects that could yield a combined energy saving of 37,000 MWh and 7 MW of demand savings. The projects would also be eligible for as much as $5.6 million in estimated incentives from OPA. One – for facility lighting – has already been completed and the application submitted to OPA.

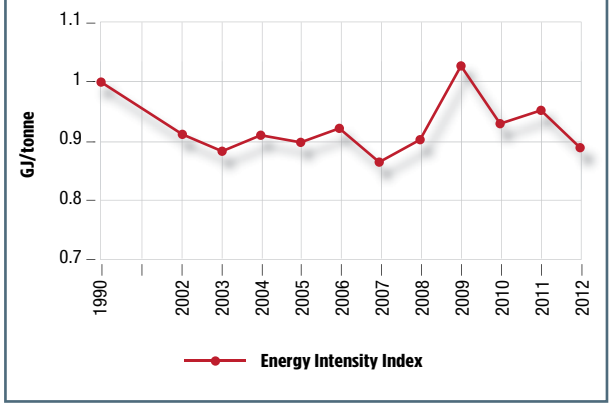
Lafarge's Cement 2020 initiative, launched in 2011 and focused initially on the Bath Cement plant in Eastern Ontario, uses lower carbon fuels to reduce the company's carbon footprint. A major milestone was reached July 2014 when a full-scale demonstration plant opened and the first round of emission testing started in October. The project, funded in part by NRCan, includes environmental non-governmental organizations (NGO) and researchers from Queen's University and is expected to produce world leading, comprehensive science to foster low carbon fuel adoption throughout the industry.

For more information on the sector, visit oee.nrcan.gc.ca/industrial/opportunities/cipec/meetings/cem/login.cfm.

HIGHLIGHTS

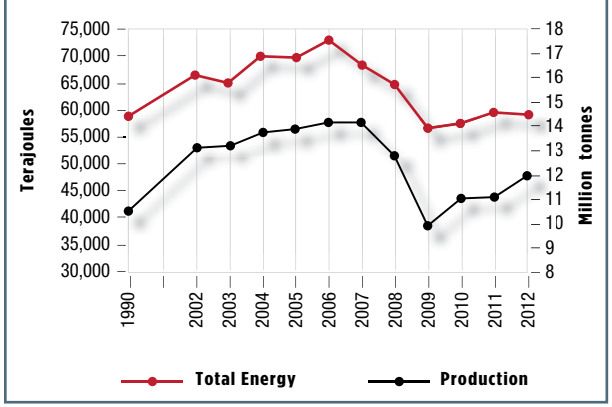
Cement Sector – NAICS 327310

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



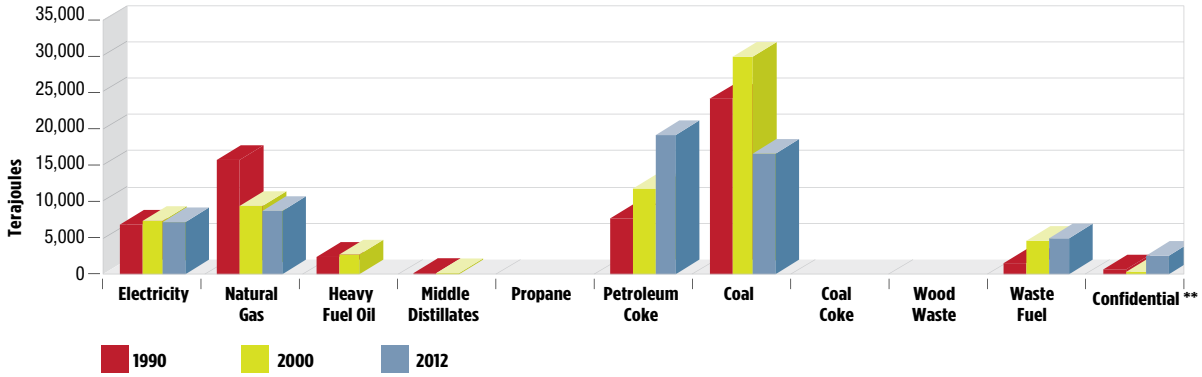
Energy intensity improved by 6.9 percent between 2011 and 2012.

Total Energy Consumption and Physical Output (1990-2012)



Between 2011 and 2012, energy consumption increase by 0.2 percent and production increased by 7.6 percent.

Energy Sources



** Confidential includes heavy fuel oil, middle distillates, propane, coal coke and wood waste.

Data source

Energy Use – Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. March 2014.

Chemicals

PROFILE

Canada's diverse chemicals sector produces organic and inorganic chemicals and synthetic resins and rubbers. Members of the Chemistry Industry Association of Canada (CIAC) produce about 75 percent of industrial chemicals manufactured in Canada.

Industrial chemical manufacturing sites are concentrated in three provinces and the distribution of chemical output is Ontario (43 percent), Alberta (27 percent) and Quebec (18 percent). The overall chemical industry employs 81,700 people directly and 410,000 indirectly.

For 2014, it is estimated that year-end sales of industrial chemicals will reach $29.1 billion, an increase of 10 percent compared to 2013.

Exports increased by 5 percent in 2014 to reach $19.6 billion. The Canadian industrial chemical industry is export-intensive, with two-thirds of domestic production being exported, and three-quarters of that going to the United States. The next largest export destinations in 2014 were China (7 percent), United Kingdom (5 percent) and Mexico (2 percent).

Operating profits for Canadian operations will rise 10 percent to $3.9 billion, setting an all-time record for the second year in a row. Low input costs due to natural gas and natural gas liquid prices and higher selling prices for chemical products were strong contributors to profitability during the year.[3]

ACHIEVEMENTS

Since 1992, CIAC members have worked hard to reduce GHG emissions through operational efficiencies and product innovation. Collectively, they have reduced CO_2 emissions by 37 percent and reduced the global warming potential of their operations by 65 percent and reduced discharges to water by 98 percent. These reductions were achieved through improved energy and emissions tracking, investing in combined heat and power facilities, and replacing or upgrading older boilers and heaters.

[3] *2014 Year-End Survey of Business Conditions*, Chemistry Industry Association of Canada.

GreenField Ethanol wins engineering and maintenance award

At the GreenField Ethanol – Johnstown Plant in Prescott, Ont., maintenance was a key consideration from day one. The maintenance team was involved early in the construction phase of the project so that it could learn the nuances of the onsite equipment and be part of the start-up team. Using computerized maintenance management applications and a variety of reliability tools such as ultrasonic, infrared and vibration analysis, maintenance managers aim to address problems proactively rather than reacting to issues as they develop. Such an intensive program has created better awareness of how to manage and maximize energy flows. As a result, the plant won a 2012 Plant Engineering and Maintenance award in the Best Maintenance-Large Facility award category.

LANXESS Canada reduces emissions

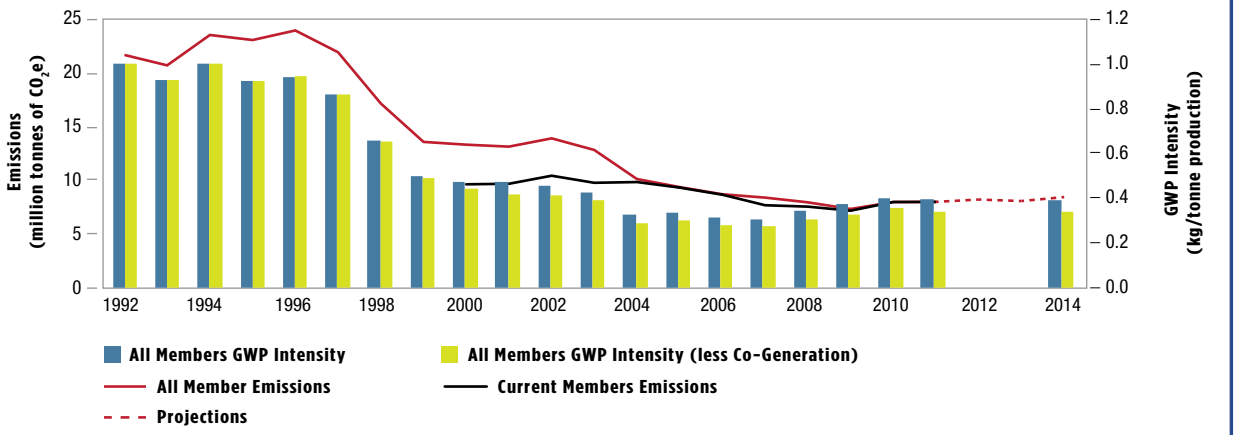
In 2013, specialty chemicals group LANXESS installed a $10 million regenerative thermal oxidizer (RTO) at its Sarnia, Ont., facility to reduce emissions of volatile organic compounds (VOC). The program has been an unqualified success. Not only has the RTO significantly reduced the plant's output of pollutants such as isoprene, isobutylene and methyl chloride, but the unit is also highly energy-efficient. The RTO consumes significantly less natural gas than other VOC-control technologies.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5261.

HIGHLIGHTS

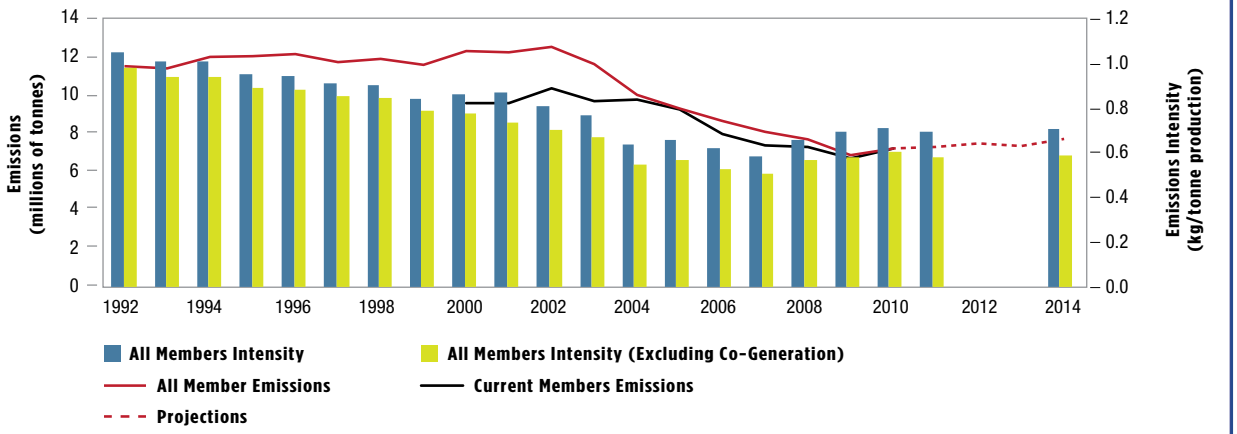
Chemicals Sector – NAICS 325

Global Warming Potential vs. Production



GWP: global warming potential, kg: kilogram

Carbon Dioxide Emissions vs. Production



The total CO_2 emissions for all CIAC members from 1992 to 2012 decreased by 37 percent.

In terms of global warming potential, member companies' GHG emissions (millions of tonnes of carbon CO_2e emissions, declined by 65 percent in 2012 compared to 1992 amounts.

Construction

PROFILE

Construction has become a cornerstone of the Canadian economy. The industry employs 1.27 million Canadians. Annually, construction is responsible for about $90 billion in economic activity or 7 percent of Canada's total GDP. In the decade ahead, the Canadian construction market is expected to become the fifth largest in the world, driven primarily by global demand for natural resources and the urgent need to modernize Canada's aging national infrastructure.[4]

The Canadian Construction Association (CCA) represents the construction sector within CIPEC. CCA is the national voice of the construction industry and has a membership of more than 17,000 firms. CCA members represent all segments of the construction of multi-storey residential, industrial, commercial, institutional and civil engineering projects.

ACHIEVEMENTS

Canadian Construction Innovations (CCInnovations) launched in the fall of 2013 with the goal of fostering discussions on innovation within the construction industry. Part of the organization's mandate is to establish systems by which research projects and programs will be identified and pursued, identify the means to commercialize new products and services, and encourage industry to adopt new innovations, technologies and practices.

[4] Canadian Construction Association

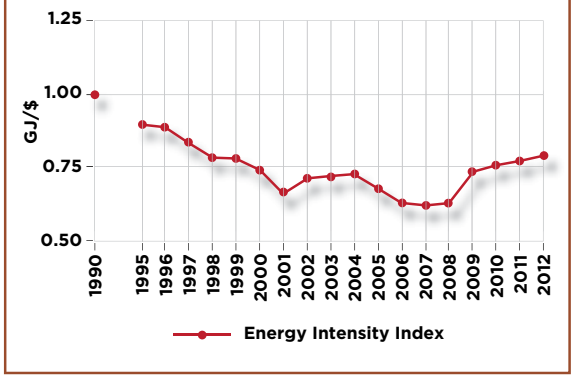
CCInnovations will accomplish these and other aims by establishing technical clusters among representatives from the construction industry, academia and ownership groups. Clusters will examine issues such as energy efficiency, building performance and sustainability in design and construction.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5271.

HIGHLIGHTS

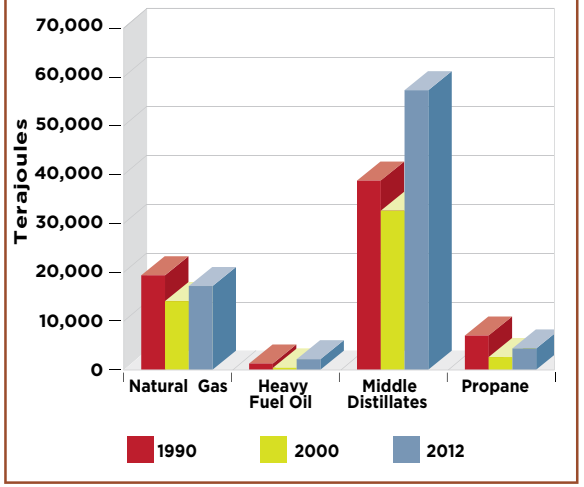
Construction Sector – NAICS 23

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



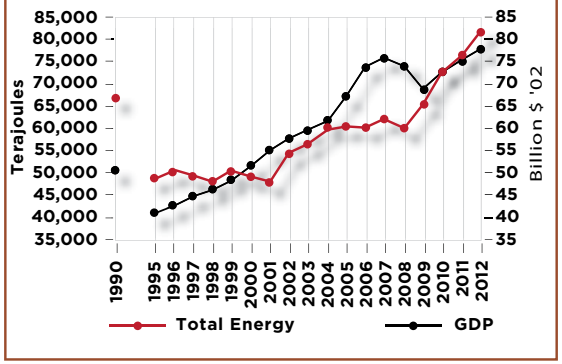
Energy intensity increased by 2.48 percent between 2011 and 2012.

Energy Sources



Between 2011 and 2012, natural gas consumption increased by 2.67 percent, and middle distillates increased by 4.42 percent.

Total Energy and Economic Output (1990-2012)



Between 2011 and 2012, total energy consumption increased by 6.12 percent while total production increased by 3.55 percent.

Data sources

Energy Use – Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. March 2014.

Output – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014.

Dairy

PROFILE

In 2012, Canada's dairy industry generated $5.92 billion in net farm receipts – the second highest total in the agricultural sector. Ontario and Quebec host about 82 percent of Canada's dairy farms, while collectively the country's three largest manufacturers – Saputo Dairy Products Canada, Agropur cooperative and Parmalat Canada Inc. – process about 80 percent of the country's total raw milk production.

Dairy producers supply two principal markets: the fluid market, which accounts for about 37 percent of total production and which includes flavoured milks and creams, and the industrial market, which draws the remaining 63 percent of supply and makes products such as butter, cheese, yogurt and ice cream.

Production of organic milk is steadily increasing. Volumes today are 89 percent higher than they were five years ago. In 2011–2012, 218 farms produced more than 93.7 million L of organic milk.[5] Production of goat milk is also increasing – to an estimated 46.7 million L in 2012.[6]

Although the cheese industry suffered a setback during the recession, it is recovering well. Average annual cheese consumption per capita increased from 12.04 to 12.66 kg between 2005 and 2012. Producers create more than 700 varieties, many of which are recognized around the world for their exceptional quality and taste.

Canadians looking for healthy and nutritional products continue to have access to an ever expanding range of quality and innovative Canadian dairy products.

Research and development of new dairy products and production methods are the result of strategic alliances among producers, processors, universities, and federal and provincial research centres.

[5] Canadian Dairy Commission
[6] *Canadian Dairy Industry at a glance*. Canadian Dairy Information Centre. June 2014.

ACHIEVEMENTS

Dairy Farm Sustainability award

Canada's dairy farms are increasingly adopting and nurturing their own sustainability efforts. In 2014, Dairy Farmers of Canada (DFC) issued its Dairy Farm Sustainability award to the farmer that adopted on-farm practices that support the objectives of DFC's sustainability strategy – namely to reduce GHG emissions, promote the efficient and sustainable management of natural resources, and benchmark the socio-economic performance of Canadian dairy farms.

The 2014 award was presented to Clovermead Farms of Alma, Ont. Operated by the Whale family, the farm features an anaerobic digester that turns manure into biogas that is used to produce electricity. Additionally, water used to cool milk is re-used as drinking water for cows. The family is also participating in a GHG mitigation project being conducted by researchers at the University of Guelph.

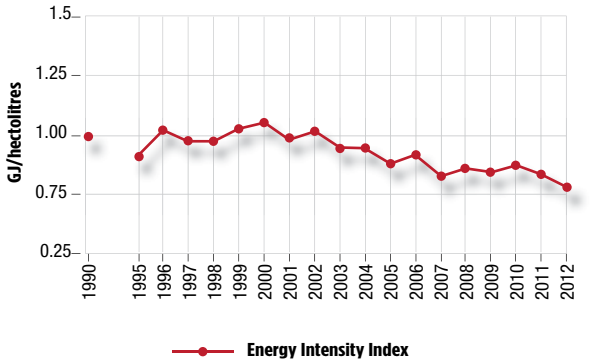
Danone Canada has also embraced eco-friendly practices. The corporation introduced two innovations in packaging in 2011 in an effort to reduce its carbon footprint by 30 percent in 2012. The first innovation is a new manufacturing process for its individual-serving products. The process reduces the overall density of plastic packaging by 18 percent. The second innovation uses an ecological, high-density polyethylene made from sugar cane instead of hydrocarbon. The material is now being used on the company's drinkable-yogurt packages. This change, which also makes the packages completely recyclable, has reduced the carbon footprint of Danone's drinkable-yogurt containers by 55 percent.

For more information on the sector, visit oee.nrcan.gc.ca/industrial/opportunities/cipec/meetings/dairy/login.cfm.

HIGHLIGHTS

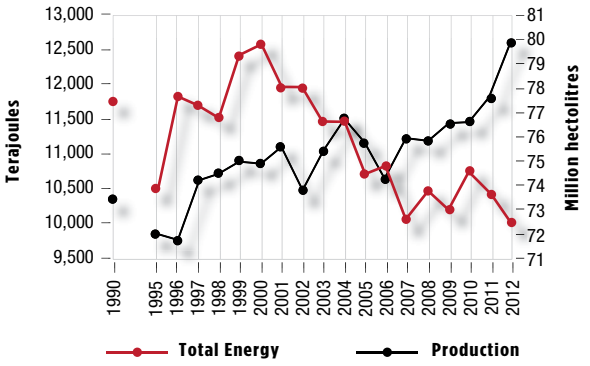
Dairy Sector – NAICS 3115

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



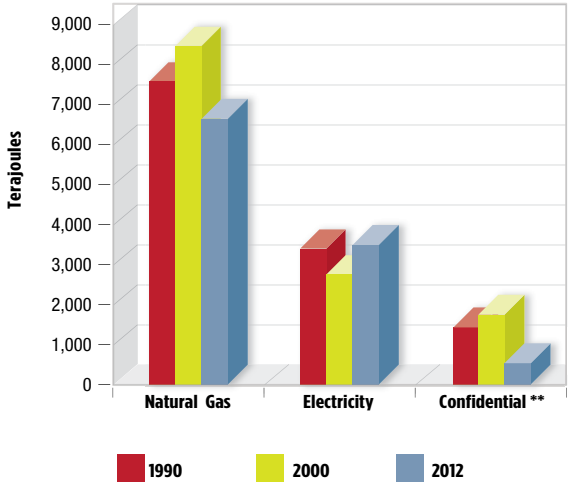
Between 2011 and 2012, energy intensity decreased by 6.62 percent.

Total Energy and Physical Output (1990-2012)



Production increased by 2.78 percent while energy consumption decreased by 4.03 percent between 2011 and 2012.

Energy Sources



** Confidential includes heavy fuel oil, propane, middle distillates and wood.

Between 2011 and 2012, natural gas consumption decreased by 5.04 percent and electricity consumption decreased by 3.81 percent.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – Informetrica Limited, *T1 Model and National Reference Forecast*, March 2013.

Canadian Dairy Information Centre, March 2014

Electrical and Electronics

PROFILE

The electrical and electronics sector includes a diverse array of companies that produce electrical appliances, lighting, consumer electronics, communications and electronic equipment, cabling, office equipment, industrial equipment, and other electrical products such as power and distribution transformers.

These companies operate more than 1,400 facilities and employ more than 130,000 workers across Canada. The sector is a major exporter and a vital, growing contributor to the national economy. It contributes more than $50 billion to Canada's economy.[7]

ACHIEVEMENTS

Company achieves ISO 50001 certification

Broan-NuTone Canada Inc., a Mississauga, Ontario-based manufacturer of residential ventilation products, recently achieved ISO 50001 certification at its plant. The certification was significant in part for helping to formalize roles and responsibilities across the company for processes such as conducting annual energy consumption reviews and identifying energy-savings opportunities.

The company has already identified seven new projects for implementation. One in particular – the installation of destratification fans and oven heat exchangers – has resulted in annual savings of 144,000 m^3 of natural gas and 24,000 kWh of electricity. In its first year operating under the ISO 50001 standard, the company has reduced plant energy consumption by 45 percent and saved an estimated $85,000 while demonstrating environmental stewardship.

[7] Electro-Federation Canada

New control system reduces natural gas consumption

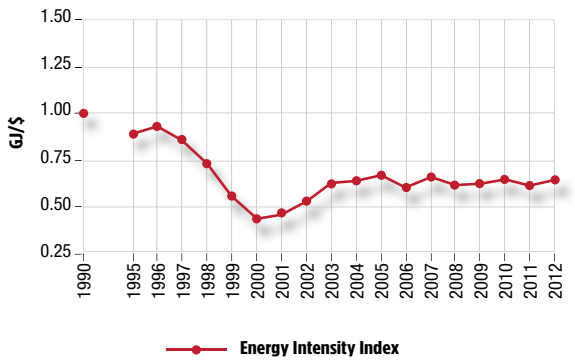
Nexans Canada is a manufacturer of electrical cables. The company recently introduced a building automation system at its 260,000-sq. ft. plant in Fergus, Ont. Its aim was to reduce the quantity of natural gas used at the plant and optimize fresh-air intake and exhaust air. By introducing monitoring and target data collection systems and upgrading much of the building's ventilation systems, the company was able to reduce its natural gas consumption by 30 percent.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5267.

HIGHLIGHTS

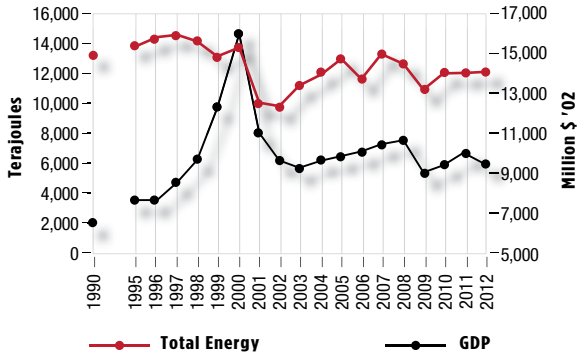
Electrical and Electronics Sector – NAICS 334 and 335

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



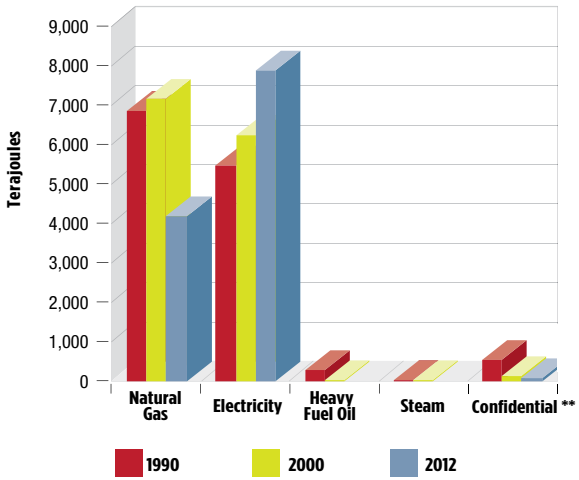
Energy intensity increased by 5.88 percent between 2011 and 2012.

Total Energy and Economic Output (1990-2012)



Total energy consumption increased by 0.42 percent while total production GDP decreased by 5.15 percent between 2011 and 2012.

Energy Sources



** Confidential includes middle distillates, propane, wood and heavy fuel oil.

Between 2011 and 2012, natural gas consumption decreased by 4.81 percent while electricity consumption increased by 3.53 percent.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. March 2014.

Output – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014.

Electricity Generation

PROFILE

The electricity generation, transmission and distribution sector maintains a reliable and highly efficient electricity system while powering industries, businesses and homes across Canada. Represented by the Canadian Electricity Association (CEA), the sector provides a reliable, essential service and is a significant contributor to the economy and the well-being of Canadians. Association members are committed to producing, delivering and using electricity in an efficient manner while promoting conservation and demand-side management. In an ongoing effort to improve its environmental performance, the sector invests in advanced technologies and enhanced environment-management practices.

ACHIEVEMENTS

CEA introduces a sustainability designation for electric utilities.

In addition to the mandatory Sustainable Electricity™ Program for its Corporate Utility Members, CEA has also developed the Sustainable Electricity Company™ designation to enable utilities to express their sustainability commitment to customers and other stakeholders. The six-step designation process, open to any utility regardless of CEA membership, is primarily based on ISO 26000, which provides guidance on how businesses and organizations can operate in a socially responsible way. Among other requirements, a company must have an environmental management system (EMS) consistent with ISO 14001 in place at the corporate or facility level.

Since the designation was launched, it has been awarded to four companies: Horizon Utilities Inc. (April 2013), AltaLink (January, 2014), Toronto Hydro Corporation (June, 2014) and Hydro One (January, 2015). For more information, visit SustainableElectricityCompany.ca.

Leading the development of carbon capture and storage

SaskPower is leading development of the world's largest post-combustion carbon capture and storage (CCS) facility. The Boundary Dam project is the first in the world to fully integrate CCS technology with commercial-scale, coal-fired electricity generation. The $1.4 billion project transformed an aging coal-fired unit at the power station into a reliable, long-term producer of 110 MW of base-load electricity. In operation since October 2014, the project will reduce the site's CO_2 emissions by up to 90 percent, capturing 1 million t of post-combustion CO_2 emissions every year.

Utility partners with Siemens on smart grid development

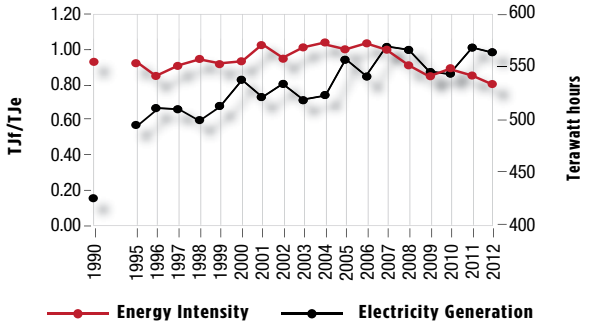
NB Power has entered into a multi-year agreement with Siemens Canada to integrate smart grid technology into the province's electrical system. A Centre of Competence will also be created as part of the agreement. The centre will be based in Fredericton, N.B., and employ an estimated 40 personnel. The partnership will bring the two companies together to accelerate the benefits of NB Power's Reduce and Shift Demand strategy. Siemen's smart grid technology will help NB Power to collaborate with customers, understand their usage in real time and reshape demand on the electricity system.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5279.

HIGHLIGHTS

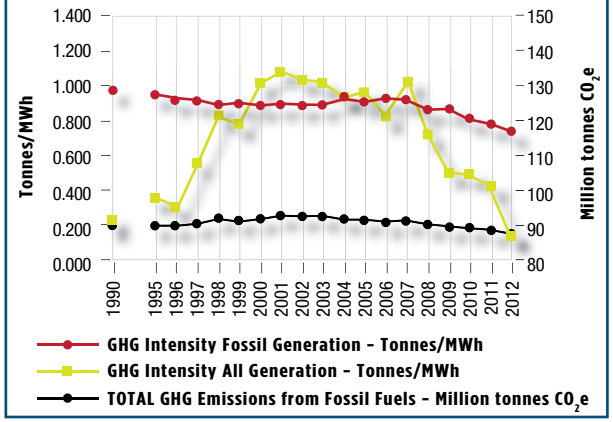
Electricity Generation Sector – NAICS 22111

Utility Production and Energy Intensity (1990-2012)***



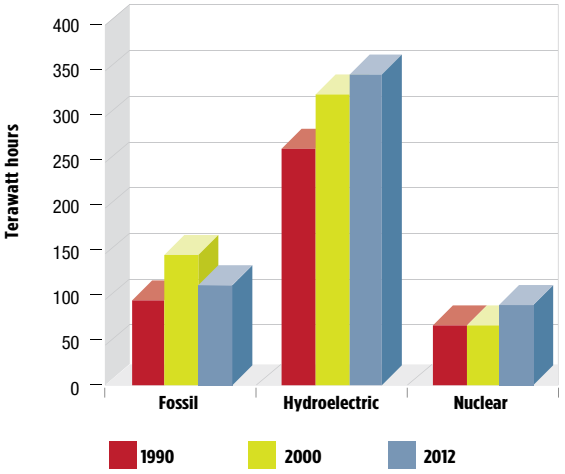
Electricity generation decreased by 1.06 percent and energy intensity decreased by 6.19 percent between 2011 and 2012.

Utility GHG Emissions vs Utility Production (1990-2012)***



Between 2011 and 2012, GHG intensity from fossil fuel generation decreased by 5.38 percent and GHG intensity for all generation decreased by 13.37 percent, while total GHG emissions from fossil fuels decreased by 14.06 percent.

Utility Generation Sources (1990, 2000, 2012)***



***This sector excludes industrial electricity generation.

Data source

Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). *Energy Use and Related Data: Canadian Electricity Generation Industry 1990-2012*. Simon Fraser University. March 2014.

Fertilizer

PROFILE

Canada supplies about 12 percent of the world's fertilizer materials. The fertilizer industry is essential to ensure the world's food needs are met in an economical and sustainable manner. Canada is the world's largest exporter of potash and elemental sulphur and a large producer of nitrogen. Represented by the Canadian Fertilizer Institute, Canadian companies in the sector contribute more than $12 billion annually to the national economy.[8]

ACHIEVEMENTS

Agrium undertakes energy efficiency projects in Canada

Agrium, the largest global agricultural retailer, has undertaken several recent projects to increase efficiency at its Canadian operations. For example, at the company's facility in Vanscoy, Saskatchewan (Sask.), new energy-efficient product dryers have reduced energy use by 13 percent. Another project involves constructing a co-generation plant (power and steam) in partnership with TransCanada Energy Ltd. at the company's facility in Carseland, Alberta (Alta.).

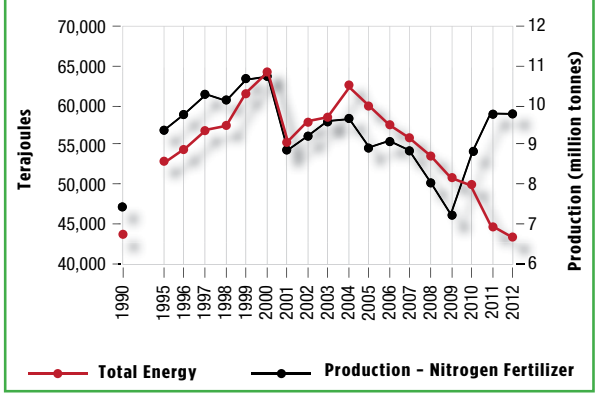
For more information on the sector, visit oee.nrcan.gc.ca/industrial/opportunities/cipec/meetings/fertilizer/login.cfm.

[8] Canadian Fertilizer Institute

HIGHLIGHTS

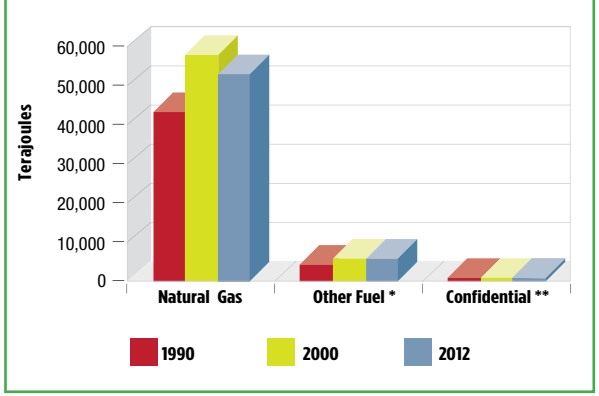
Fertilizer Sector (Nitrogenous) – NAICS 325313

Total Energy and Physical Output (1990-2012)



Between 2011 and 2012, production decreased by 4.24 percent while energy use increased by 0.17 percent and energy intensity increased by 4.6 percent.

Energy Sources



* Other Fuel includes electricity and propane.

** Confidential includes coal, petcoke, heavy fuel oil, middle distillates and steam.

Natural gas consumption increased by 0.10 percent between 2011 and 2012. In 2012 the majority of other fuels have been included in the confidential data.

Data sources

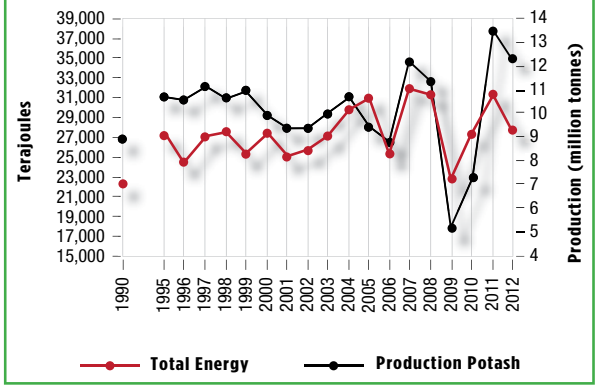
Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. April 2014.

Production – GDP – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014.

Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. April 2014.

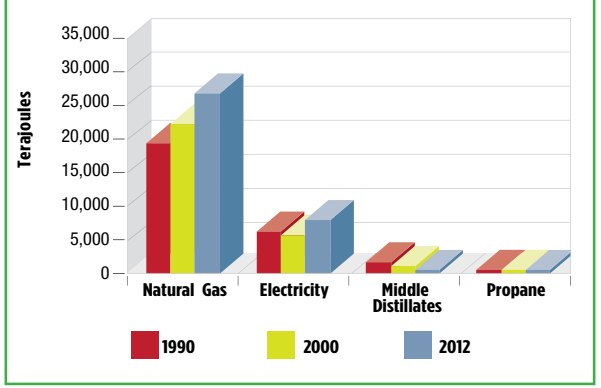
Fertilizer Sector (Potash) – NAICS 212396

Total Energy and Physical Output (1990-2012)



Between 2011 and 2012, production decreased by 14.27 percent and energy use decreased by 7.86 percent while energy intensity increased by 7.48 percent.

Energy Sources



Natural gas consumption decreased by 9.02 percent and electricity consumption decreased by 3.61 percent between 2011 and 2012.

Data sources

Canadian Fertilizer Institute (CFI), 1990, 1999-2009, November 2010.

Canadian Fertilizer Institute (CFI), 1995-1998, March 2006.

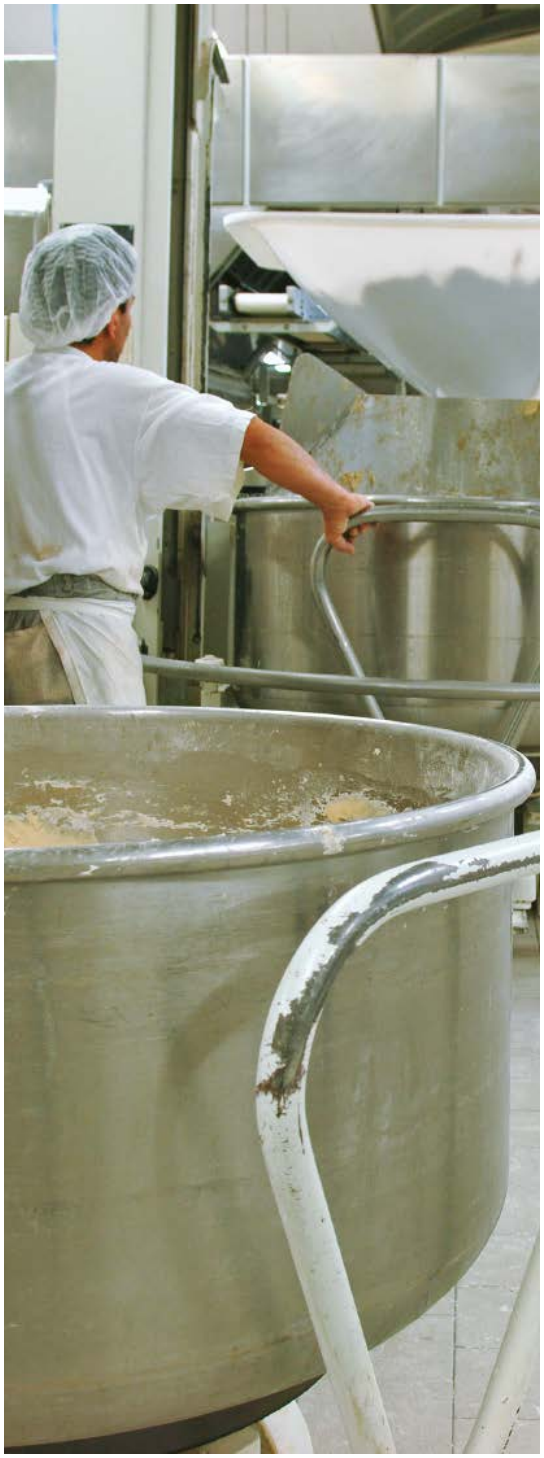
Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. March 2014.

Energy Use – Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. March 2014.

(1) Natural Gas – 1990, 1999-2006, Canadian Fertilizer Institute, November 2010.

Natural Gas – 1995-1998, Canadian Fertilizer Institute, March 2011.

(2) Other Fuels – 1990-2005, Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). *Development of Energy Intensity Indicators for Canadian Industry 1990-2011*. Simon Fraser University. March 2013.



Food and Beverages

PROFILE

Canada's food and beverage sector includes manufacturers that produce meat, poultry, fish, fruit and vegetables, flour and bakery products, oils and sugars, coffee, snack foods, soft drinks, and confectionery. The food and beverage processing industry is the largest manufacturing industry in Canada in terms of value of production with shipments worth $92.9 billion in 2012. It accounts for 16 percent of total manufacturing shipments and for 2 percent of the national GDP.

It is the largest manufacturing employer and provides employment for 290,000 Canadians. It supplies about 75 percent of all processed food and beverage products available in Canada and is the largest buyer of agricultural production, using about 35 percent of its output. It is also the largest manufacturing employer in rural areas across Canada.

Exports of processed food and beverage products stood at $23.3 billion in 2011, an increase of 12 percent over 2010; accounting for 25 percent of production value.[9]

ACHIEVEMENTS

PepsiCo Green Teams are a powerful internal force for sustainability

PFC introduced employee-based Green Teams across all its manufacturing facilities in the early 1990s. The goal was to raise employees' environmental awareness and ensure compliance with federal, provincial and municipal laws and regulations. As the teams became more sophisticated in expertise and process, their role evolved from one in support of compliance to support of conservation. Today, PFC Green Teams focus on sustainability efforts that will benefit the company and the environment. The work of these employee teams, along with broader sustainability efforts at PFC, recently led Maclean's Magazine to name the company one of the Top 50 Socially Responsible Companies in Canada.

In recent years, PFC has taken various steps to reduce energy use. The company's vehicle fleet has benefited significantly. In 2012, the fleet added seven hydrogen-assist transport tractors, which are 15 percent more fuel-efficient than traditional vehicles. The company also put eight Ford Transit Connect service vehicles into service in 2011. These urban delivery trucks are 40 percent more efficient than previously used service vans. New Pepsi-branded refrigeration equipment is ENERGY STAR rated and 54 percent more efficient than older models.

With the 2011 launch of the 7UP EcoGreen™ bottle in Canada, the company reduced the amount of virgin plastic by about 2.7 million kilograms in one year. This

[9] *Significance of the Food and Beverage Processing Industry in Canada, 2012*. Agriculture and Agri-Food Canada

resulted in reductions of more than 30 percent in GHG emissions and more than 55 percent in energy use.

While the company aims to reduce water use at all its food production facilities, PFC's ultimate goal is to achieve water balance by drawing little to no municipal water for manufacturing. The company has taken sure steps toward this goal with the implementation of two water-recycling technologies at its largest Frito-Lay plant in Cambridge, Ont. One system injects a solution to manage organic loading in the water and allow its reuse in the production process. The second system uses hydro-cyclones to mechanically filter water from potato peelers so that it can be reused, making the system a virtually closed loop. These technological advances have helped the Cambridge facility save more than 90 million L of water annually compared to 1999.

PFC carefully designs beverage packaging to appeal to consumers, protect the integrity of the contents and minimize environmental impact throughout the package's life cycle. By implementing onsite bottle blowing production at plants in Toronto, Montréal, Winnipeg and Vancouver, the company is further reducing its environmental impact by significantly reducing related fuel and electricity use.

Old Dutch installs a membrane bioreactor system to treat effluent

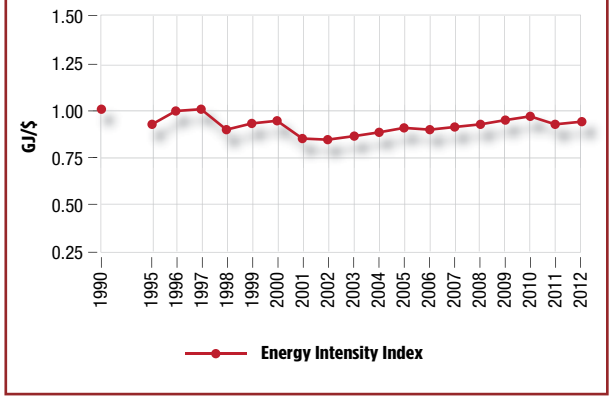
Processing high volumes of corn and potatoes at the Old Dutch Snack Foods Ltd. plant in Hartland, N.B., results in wastewater that is difficult to treat. The company recently installed a membrane bioreactor system that produces a treated effluent to comply with strict limits for direct discharge into the Saint John River. This technology uses a submerged physical membrane barrier, instead of gravity clarification, to separate liquid and solid waste. The major system components include an 1,100-m^3 aeration tank, two tanks with submerged membrane units, a sludge dewatering system, aeration blowers, pumps and instrumentation and controls.

For more information on the sector, visit oee.nrcan.gc.ca/industrial/opportunities/cipec/meetings/fandb/login.cfm.

HIGHLIGHTS

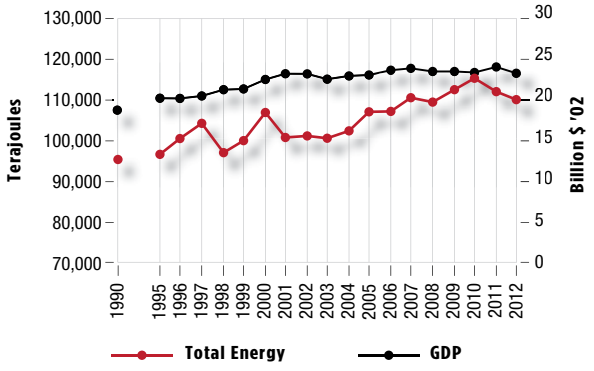
Food and Beverage Sector – NAICS 3121

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



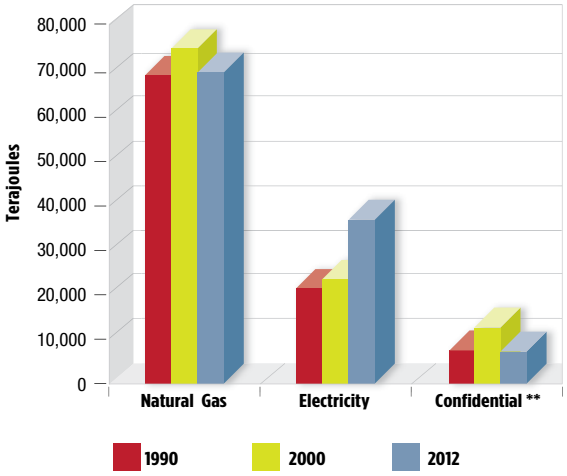
Between 2011 and 2012, energy intensity increased by 1.4 percent.

Total Energy and Physical Output (1990-2012)



The GDP decreased by 3.2 percent and energy consumption decreased by 1.9 percent between 2011 and 2012.

Energy Sources



** Confidential includes coal, heavy fuel oil, middle distillates, propane, wood and steam.

Natural gas consumption decreased by 2.3 percent while electricity consumption increased by 0.6 percent between 2011 and 2012.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014.

Forest Products

PROFILE

The Forest Products sector is composed of the wood products and pulp and paper industries.

The wood products sector comprises about 700 facilities in primary and secondary manufacturing. The primary grouping includes commodity-based production facilities such as lumber and structural panels and more specialized production facilities that manufacture engineered wood products and assemblies. The secondary grouping encompasses a diverse range of facilities that manufacture prefabricated buildings, windows and doors, flooring, mouldings, containers and pallets, other millwork, and numerous other products.

The pulp and paper sector comprises about 95 facilities in primary manufacturing. The sector includes commodity-based production facilities such as pulp, newsprint, paper, tissue, sanitary and paperboard products. The pulp and paper sector is currently transforming to produce more specialized goods such as bio-based chemicals and bio-energy.

ACHIEVEMENTS

Projects supported by the Investment in Forest Industry Transformation program

Producing renewable energy from waste at Millar Western

With the support of the Investment in Forest Industry Transformation (IFIT) program, the Millar Western Forest Products Ltd. pulp mill in Whitecourt, Alta., will be the first in Canada's

forest sector to employ innovative anaerobic hybrid digester (AHD) technology to improve effluent treatment and generate bioenergy for use as an alternative to fossil fuels.

The Bioenergy-Effluent Project will use AHD technology to pre-treat effluent and produce a methane-rich biogas. After being scrubbed to remove hydrogen sulfide, the biogas will be used to co-generate electricity and heat, replacing natural gas and fossil-fuel-derived electricity in mill processes. The removed hydrogen sulfide will be converted into sulphuric acid to improve effluent treatment and reduce treatment costs, water intake and greenhouse gas production.

Biomethanol: Off-gas, onsite at Al-Pac

Alberta-Pacific Forest Industries Inc. (Al-Pac) is ramping up to produce methanol from stripper off-gas, a pulp mill waste stream. The company's production of biomethanol will replace fossil-fuel-derived methanol and eliminate the energy consumption associated with its transport. This world-first application of Canadian technology has the potential to be replicated in many kraft pulp mills across the country.

One line, multiple benefits for Tolko

Innovative technologies funded by IFIT will make Tolko Industries the first facility in North America to produce advanced strand-based specialty and oriented strand board commodity products on one production line. The project will add efficiencies to Tolko's plant in Meadow Lake, Sask., by utilizing wood dust and unusable fines as a fuel source for the energy system. The project will also allow Tolko to produce a wider range of technically advanced products, reduce production costs, and maintain or enhance overall quality and performance.

Electricity from waste heat at Nechako

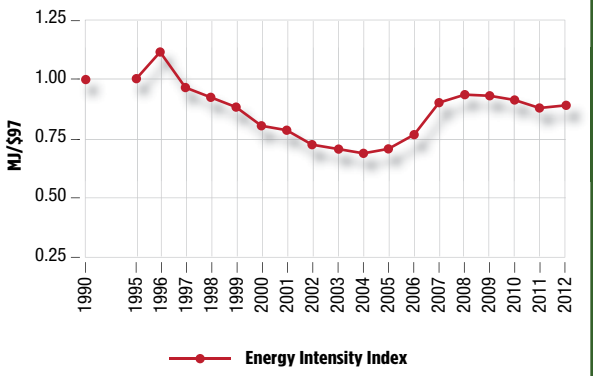
A first for Canada's forest sector, Nechako Lumber Company Ltd. has implemented an organic Rankine cycle system to generate electricity at its lumber processing facility in Vanderhoof, B.C. The system extracts biomass-derived waste heat to deliver a stable source of green energy for the plant, replacing energy purchased from a utility. The project provides Nechako with revenue diversification and stability, as well as the potential to replicate benefits across the sector.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5281.

HIGHLIGHTS

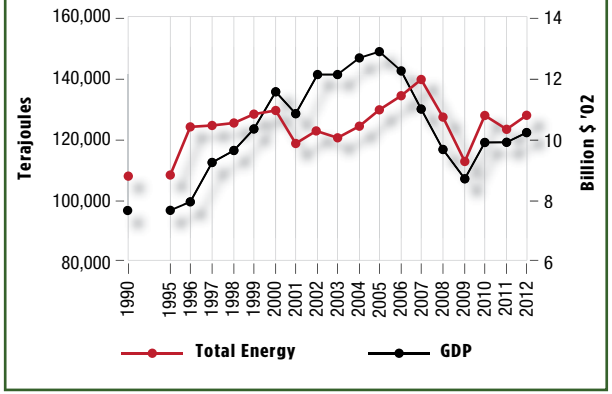
Wood Products Sector – NAICS 321

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



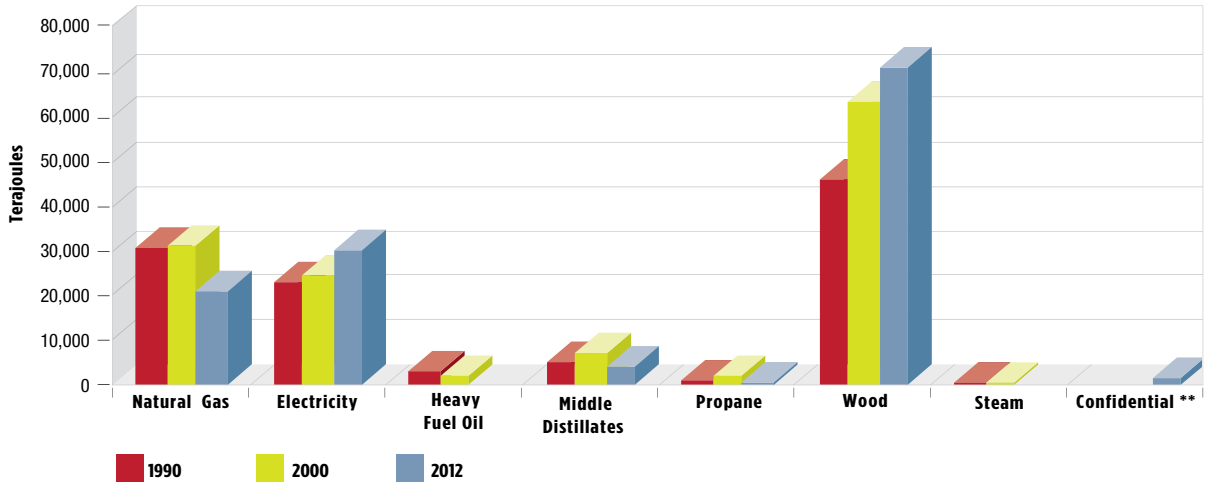
Between 2011 and 2012, energy intensity increased by 0.3 percent.

Total Energy and Economic Output (1990-2012)



Production increased by 3.6 percent and energy consumption increased by 3.9 percent 2011 and 2012.

Energy Sources



** Confidential includes heavy fuel oil and steam.

Between 2011 and 2012, middle distillate consumption decreased by 7.0 percent, wood consumption increased by 5.1 percent, electricity consumption decreased by 4.7 percent while natural gas consumption increased by 18.9 percent.

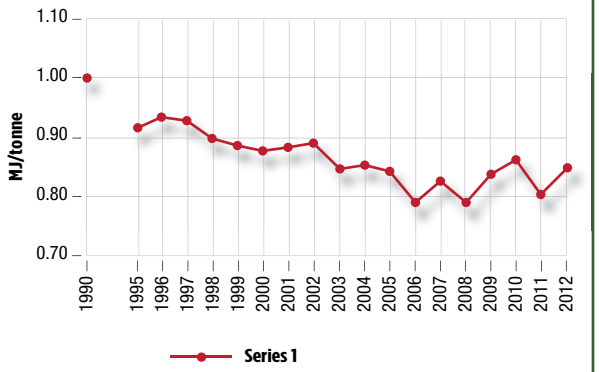
Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – GDP – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014.

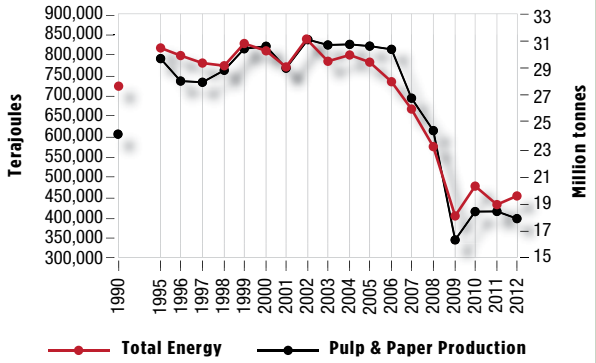
Pulp and Paper Sector – NAICS 3221

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



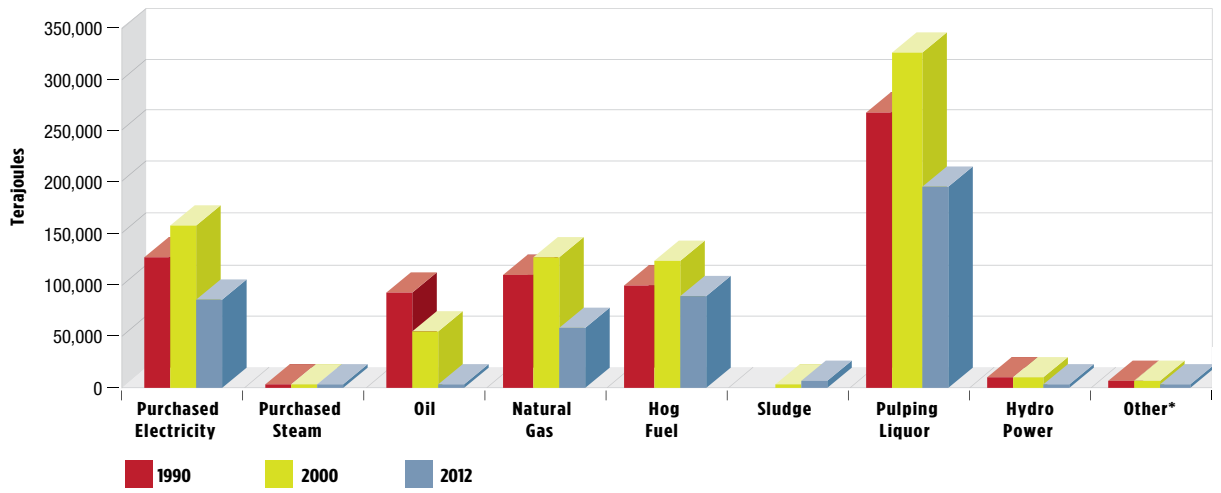
Between 2011 and 2012, energy intensity decreased by 7.4 percent.

Total Energy and Physical Output (1990-2012)



Total energy consumption decreased by 7.1 percent while total production increased by 0.3 percent between 2011 and 2012.

Energy Sources



* Other includes coal, middle distillates, diesel, propane, other purchased energy and other self-generated energy.

The decrease in oil use continues to decline while the use of biomass and renewables continues to increase. Several energy efficiency projects under the Pulp and Paper Green Transformation Program were fully operational in 2011, which lead to the energy consumption reduction.

Data source

Forest Products Association of Canada, *Annual Energy Survey, 1990-2012.*

Foundry

PROFILE

The Canadian foundry industry is made up of about 150 companies that employ about 10,000 Canadians to produce metal castings, which is the first step in the value-added manufacture of most durable goods. The raw material is typically recycled metal, which conserves precious natural resources and energy and improves profitability – an important consideration given the intensely competitive global casting market into which the industry exports more than three-quarters of its total production.

Foundry operations have become increasingly varied and complex in recent years. Using iron, steel, magnesium, aluminum, zinc, brass and bronze, today's value-added operations not only produce raw castings, they also design the parts, build the tooling, cast the prototypes and produce the components ready to install on customers' assembly lines.

Markets and industries include the automotive sector, construction, agriculture, forestry, mining, pulp and paper, heavy industrial machinery and equipment, aircraft and aerospace, plumbing, soil pipe, municipal road castings, defence, railway, petroleum and petrochemical, electric distribution and myriad specialty markets.

ACHIEVEMENTS

Following an audit of its fusion process, Quebec's Bibby Ste-Croix foundry is seizing opportunities to improve its control systems and concurrently reduce coke consumption and GHG emissions. The facility's 62-inch (in.) cupola is being replaced with a new 48-in. unit that will be lined to reduce the thermal loss of the fusion process. The foundry is also installing a new dehumidification unit to extract moisture from the hot blast, which will reduce fuel use. Other efficiency upgrades include a new control room and centralized instrumentation on a new programmable logic controller network.

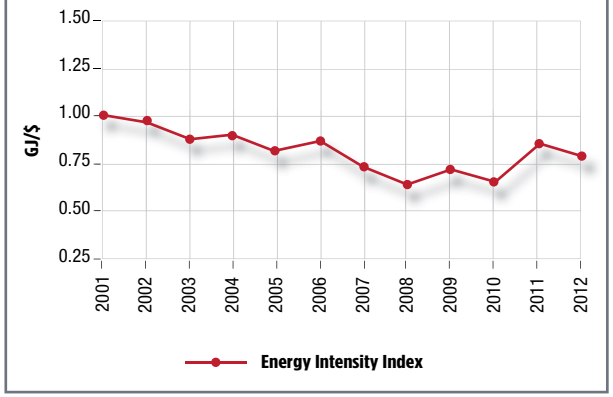
Partially funded by the provincial government's Ministry of Natural Resources, the project is expected to reduce annual coke consumption by 1,300 to 1,400 t. GHG emissions will be reduced by 30 percent, or more than 1,800 t of CO_2. More than 130 t of cupola dust will also be diverted from landfills.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5275.

HIGHLIGHTS

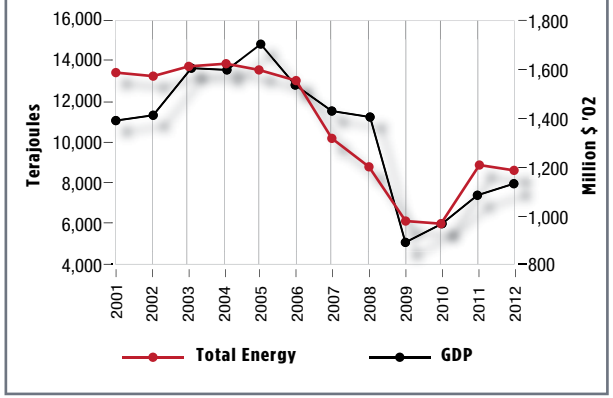
Foundry Sector – NAICS 3315

Energy Intensity Index (2001-2012) Base Year 2001 = 1.00



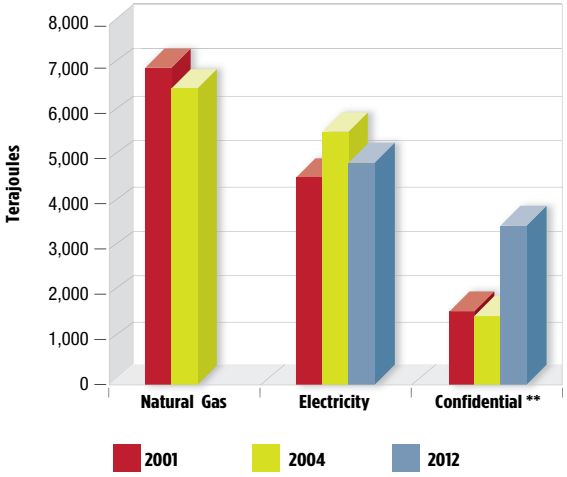
Between 2011 and 2012, energy intensity decreased by 7.9 percent.

Total Energy and Economic Output (2001-2012)



The GDP increased by 4.8 percent while energy consumption decreased by 3.6 percent between 2011 and 2012.

Energy Sources



** Confidential includes natural gas, coal coke, heavy fuel oil, middle distillates, wood and propane.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014.

General Manufacturing

PROFILE

Ontario and Quebec have sizable manufacturing sectors; there are also many manufacturers in B.C. and the Atlantic and Prairie provinces. The general manufacturing sector includes a variety of industries not otherwise covered in the sector descriptions of this report, including leather, clothing, furniture, printing activities, glass and glass products, adhesives, tobacco products and pharmaceuticals, as well as construction materials such as floor coverings and insulation.

More than 1.8 million Canadians are employed in manufacturing. Manufacturing accounts for 12 percent of the total Canadian GDP.[10]

ACHIEVEMENTS

Canadian Manufacturers and Exporters Energy and Environment program

Through its Energy and Environment program, the Canadian Manufacturers and Exporters works with the private sector and government regulators to help companies maintain and improve their competitiveness in an environmentally responsible manner.

The program focuses on three key areas: climate change, ensuring a competitive and harmonized approach to related Canadian policy; the *Canadian Environmental Protection Act* (the Act), ensuring the federal government introduces effective and harmonized regulations under the Act; and energy supply, ensuring the reliable and cost-effective availability of energy and electricity across Canada.

[10] Canadian Manufacturers and Exporters

Lincoln Electric Canada achieves ISO 50001 Certification

In 2013, Lincoln Electric became the fourth Canadian company to achieve ISO 50001 certification. The firm, which produces welding wire and equipment in its Toronto facility, sees energy efficiency as vital to remaining viable as a Canadian manufacturer. Lincoln had to look no further than rising energy prices to support the business case for energy management. An energy assessment in 2011 suggested possible reductions in electricity intensity of as much as 16.5 percent with a concurrent reduction in GHG emissions of up to 950 t annually. With support from CIPEC and NRCan's ecoENERGY Efficiency for Industry program, Lincoln Electric embedded energy management in all facets of the organization, from purchasing to engineering. The company achieved energy savings of 22 percent in 2013, a significant contribution toward energy reduction targets of 2 to 3 percent at all Lincoln Electric facilities worldwide.

KI Pembroke LP wins 2014 Leadership award for Employee Awareness and Training

In May 2014, this manufacturer of steel office furniture in Pembroke, Ont., was recognized by CIPEC for remarkable achievement in energy saving through employee awareness. KI Pembroke LP attributes about 25 percent of its energy savings to staff efforts. The facility saved 425,000 m^3 in natural gas and 970,000 kWh in electrical consumption in the first eight months of 2013.

The reduction in gas consumption is largely due to effective new shutdown procedures for which every employee has taken responsibility. Electrical savings are also due, in large part, to the facility's energy awareness campaign since employees are now shutting off motors, compressors, HVAC systems and associated pumps when not needed.

Atlantic Packaging Products realizes benefits of embedded energy manager

Atlantic Packaging's two Toronto-area mills combined use more than 270 million kWh of electricity and about 53 million m^3 of natural gas in 2013. As a result, when OPA, now IESO, launched its embedded energy manager program, the company leapt at the opportunity to reduce energy consumption. The program funds 80 percent of energy manager salaries and an additional 80 percent of annual expenses.

Atlantic hired two dedicated professionals who achieved savings of 1,200 kW of demand load and more than 9 million kWh of electricity in the first year alone. One major project added freeness analyzers to a paper-machine refiner. At a cost of $240,000, the upgrade is expected to reduce electricity usage by 25 percent annually with a payback period of less than six months. Another project involved development of proprietary software that enables the company to accurately forecast Ontario peak-period demand and significantly reduce the economic impact of global adjustment charges on each facility.

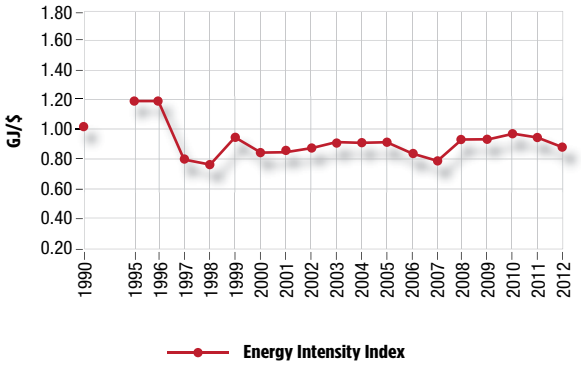
For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5265.

HIGHLIGHTS

General Manufacturing Sector – NAICS

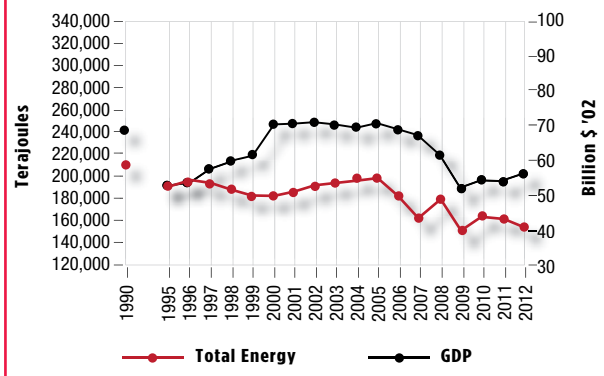
NAICS Name	Category
Textiles	313 and 314
Clothing and Manufacturing	315
Leather and Allied Product	316
Rubber Products	3262
Printed and Related Support Activities	323
Fabricated Metal Product	332
Machinery	333
Furniture and Related Product	337
Miscellaneous Manufacturing	339
Tobacco Product Manufacturing	3122
Converted Paper Product Manufacturing	3222
Non-metallic Mineral Product not Elsewhere Classified	3271, 3272, 32732, 32733, 32739, 32742 and 3279
Chemical Manufacturing not Elsewhere Classified	32522, 325314, 32532, 3254, 3255, 3256 and 3259

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



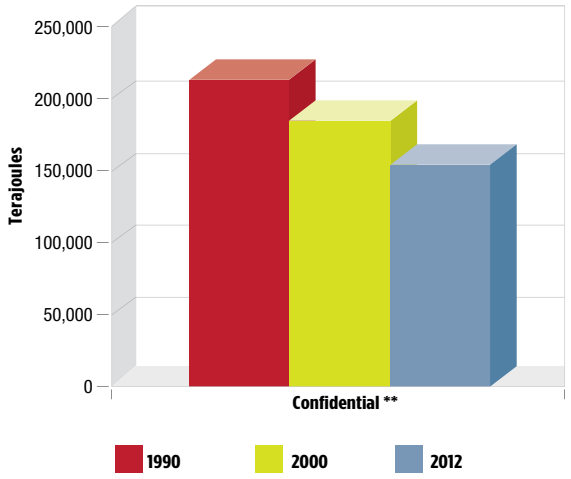
Between 2011 and 2012, energy intensity decreased by 8.1 percent.

Energy Intensity and Economic Output (1990-2012)



Production increased by 3.1 percent and energy consumption decreased by 5.2 percent between 2011 and 2012.

Energy Sources

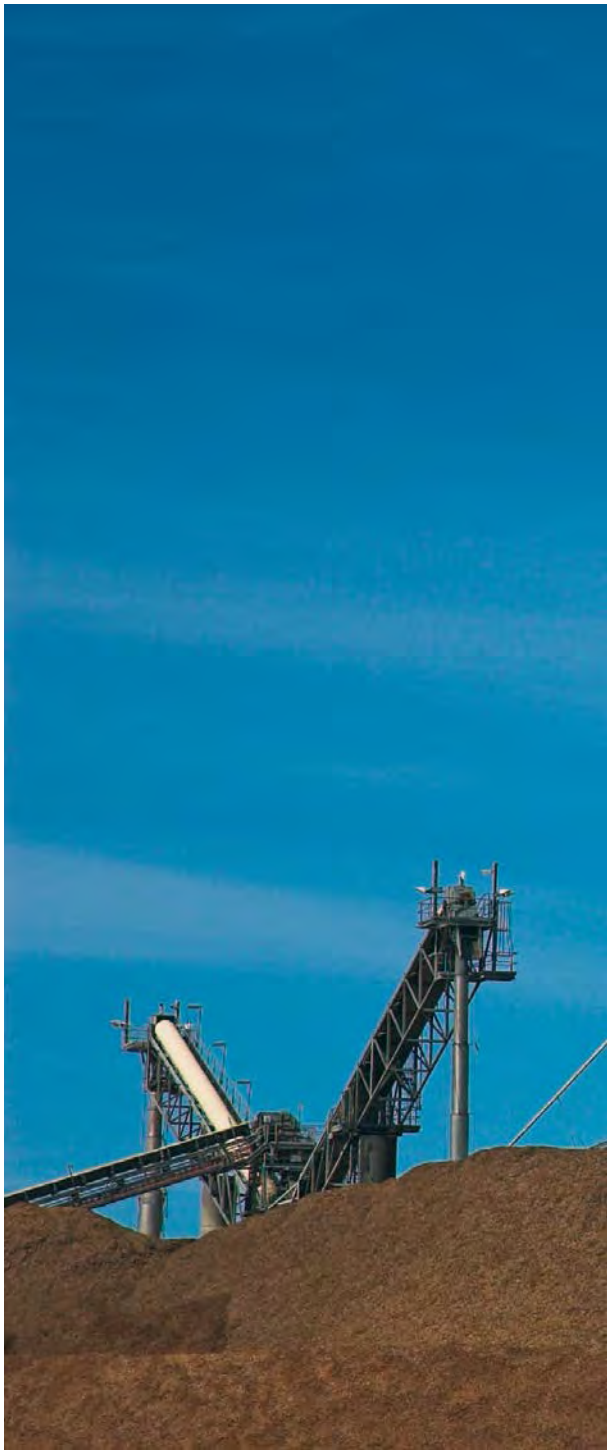


** Confidential includes coal, coke, petroleum coke, heavy fuel oil, middle distillates, propane, wood waste, steam, natural gas and electricity.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014; Statistics Canada National Accounts: Industry-based.



Lime

PROFILE

The Canadian Lime Institute represents all merchant lime producers operating in Canada. The lime sector produces an essential raw material for the production of chemicals, alumina, uranium, paper, steel, gold and other vital materials.

Lime products are used in a variety of other applications including:

- flue gas desulphurization
- agriculture
- manure treatment
- soil stabilization and remediation
- asphalt
- oil and gas
- power generation
- building construction

More than 150 cities, towns, rural communities and aboriginal communities across Canada depend on lime for use in water, wastewater and sewage treatment systems. Many rural regions also benefit from the steady, long-term, well-paying employment supplied by Canada's lime production operations.

ACHIEVEMENTS

Graymont upgrades to enable use of lower-emission fuels

Graymont is working to minimize its environmental footprint and combat climate change by producing lime with the lowest CO_2 emissions intensity in North America. The company continues to explore state-of-the-art kiln technologies and enhanced automation and process control to increase energy efficiency and reduce emissions.

Graymont recently upgraded its Bedford and Marbleton sites in Quebec to burn natural gas and potentially use other lower-emission fuels. The company reports that natural gas is increasingly being used at other facilities in the Great Lakes and Western Canada regions. Sites in Marbleton and Faulkner, Manitoba, are continuing development work on the use of biomass.

Carmeuse monitoring program increases emission controls

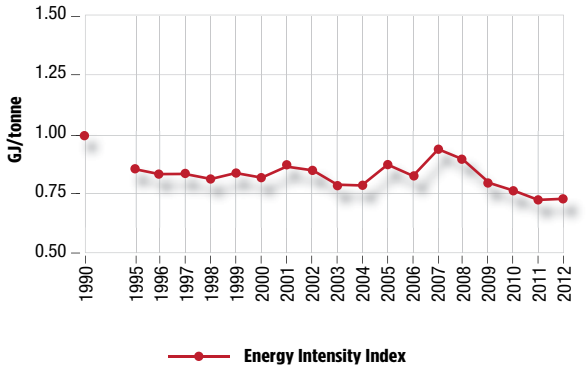
Carmeuse has put in place proven and reliable processes to manage carbon emissions in the production of lime and limestone. For example, the company's monitoring program has progressively increased emissions controls and related instrumentation not only to ensure its kiln operations conform to industry and government regulations, but also to reduce the environmental impact on surrounding communities.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5283.

HIGHLIGHTS

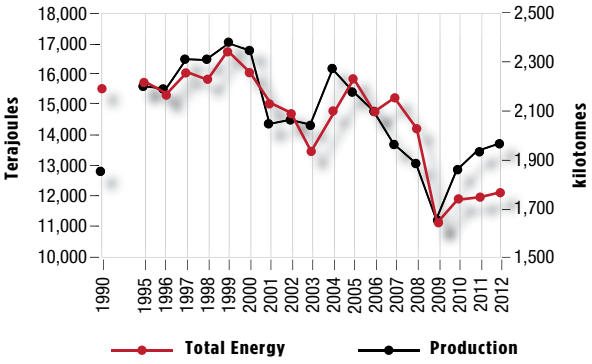
Lime Sector – NAICS 327410

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



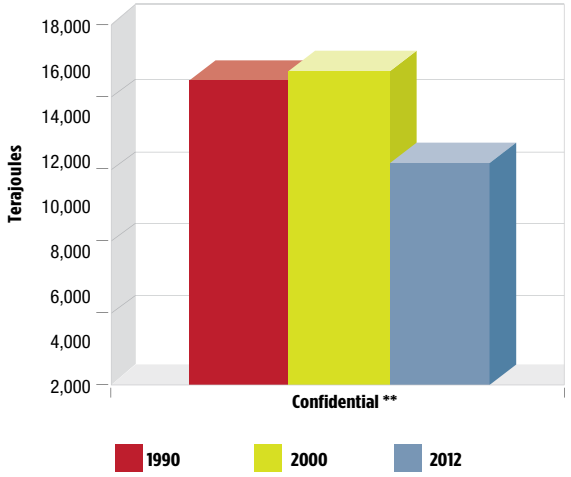
Between 2011 and 2012, total energy intensity decreased by 1.2 percent.

Total Energy and Physical Output (1990-2012)



Total production increased by 1.4 percent while total energy consumption increased by 0.2 percent between 2011 and 2012.

Energy Sources



** Confidential includes heavy fuel oil, middle distillates, propane, wood, petroleum coke, coal, electricity and natural gas.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – Minerals & Metals Sector, Natural Resources Canada. 2014.

Mining

PROFILE

Mining is one of Canada's most important economic sectors and is a major contributor to our country's prosperity. In 2012, the industry contributed $52.6 billion to our GDP and employed 418,000 workers in the mineral extraction, processing and manufacturing sectors. This industry stimulates and supports economic growth, both in large urban centres and in remote rural communities, including numerous First Nations communities; mining is a major employer of Aboriginal Canadians.

Mining accounts for 20.4 percent of Canadian goods exports. The industry also generates considerable economic spin-off activity: there are about 3,200 companies that provide services to the industry that range from engineering consulting to drilling equipment.[11]

The Mining Association of Canada is the national organization of the Canadian mining industry and represents companies involved in mineral exploration, mining, smelting, refining and semi-fabrication.

ACHIEVEMENTS

New Afton Mine achieves ISO 50001 certification

Given low commodity prices and increasing offshore competition, energy efficiency improvement is one of the few places where profitability can be found in the gold mining industry. That's why ISO 50001 certification was so attractive to New Gold Inc. With the achievement, the company's New Afton Mine near Kamloops, B.C., became North America's first gold mine to implement the standard as of Q1 2014. Energy savings have exceeded 2.4 GWh since then, putting the

[11] *Facts & Figures of the Canadian Mining Industry*. 2013. The Mining Association of Canada

mine on track to achieve its overall 2014 energy-savings objective of 9 GWh. New Gold has found that improvements can be accomplished with minimal capital injection using innovation, creativity and, most importantly, an energy management information system. In one project, feeds from multiple meters were tied into aggregators to dramatically reduce submeter costs.

Mine employees have also been stepping up with ideas to save energy and reduce costs. In one example, operations personnel took the initiative to shut down conveyor systems during shift changes – a simple step that saves about $12,500 per month.

Exploring the benefits of natural gas as a fuel source at Renard Diamond Project

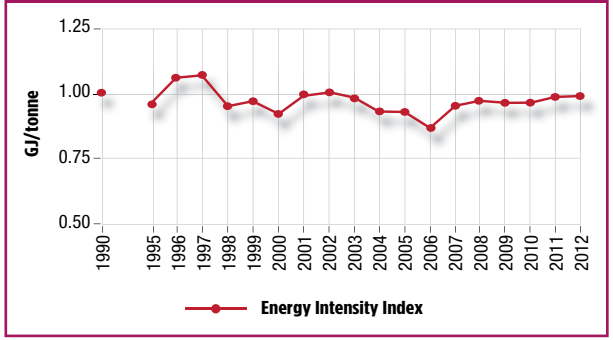
Stornoway Diamond Corporation's Renard Diamond Project is a recent example of a mining company embracing the benefits of natural gas. In October 2013, the company announced positive results from a feasibility study on the viability of a power plant fuelled by liquefied natural gas (LNG). The study showed that LNG could deliver substantial reductions in operating costs and environmental emissions compared to a diesel generator option. The annual operating cost reductions are estimated at $8 million to $10 million in the first 11 years, representing mine-life cost savings of $89 million, or 6.6 percent. The net payback period could be as short as four months given an incremental capital cost of only $2.6 million to replace diesel with LNG. GHG emission reductions are estimated at 43 percent with significant additional reductions in nitrogen dioxide and sulphur dioxide output.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5257.

HIGHLIGHTS

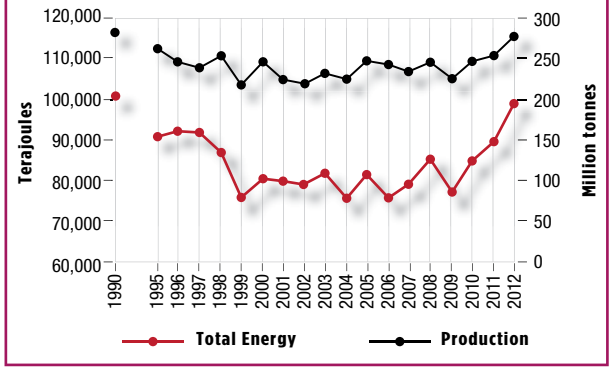
Metal Mining Sector – NAICS 2122

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



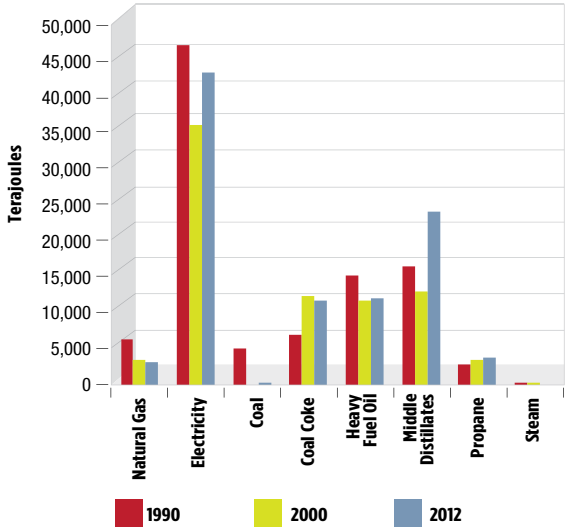
Between 2011 and 2012, energy intensity increased by 1.3 percent. This is consistent with the longer term and stable relationship between the energy required per unit of extracted metal ore dating back to the early 1990s.

Total Energy and Production Output (1990-2012)



Production increased by 8.6 percent while energy consumption increased by 10.0 percent. This relationship illustrates that the amount of energy required per unit of production increases as miners extract minerals and metals from today's older and deeper mines.

Energy Sources



Electricity consumption increased by 13.0 percent and middle distillates consumption increased by 15.4 percent.

Data source

Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. March 2014.

Oil Sands

PROFILE

Alberta's oil sands are the third-largest proven crude oil reserve in the world, next to Saudi Arabia and Venezuela.

Through responsible development, advancement of technology and significant investment, the Government of Alberta is working in conjunction with industry to enhance Alberta's role as a world-leading energy supplier. New projects are being added every year and production is expected to increase from 1.9 million barrels per day in 2012 to 3.8 million barrels per day by 2020, keeping pace with demand and providing a sound economic basis for the future.[12]

ACHIEVEMENTS

Alberta Oil Sands Energy Efficiency and GHG Mitigation Roadmap Program

With funding from the Climate Change Emissions Management Corporation and support from Alberta Innovates – Energy and Environment Solutions, Suncor Energy Services Inc. teamed with Jacobs Consultancy Canada Inc. to complete an oil sands energy efficiency and GHG emissions roadmap study. The primary objective of the study was to identify, assess and quantify energy efficiency and GHG emission reduction opportunities for commercial oil sands operations, and determine their potential impact on the GHG intensity of fuels refined from oil sands bitumen.

The study found that technologies to improve energy efficiency could significantly close the GHG intensity gap between bitumen-derived crude oils and heavy crude oils produced outside Alberta. For example, mining and extraction that integrates low-level waste-heat sources from upgraders or onsite power generation can reduce the GHG intensity of bitumen extraction by 30 to 50 percent over operations that use natural gas to generate hot water for extraction.

[12] Alberta Energy: Oil Sands

Kearl oil sands mine employs the latest energy efficiency technology

Now a year into production, Imperial Oil's $12.9-billion Kearl oil sands mine is gradually ramping up to full production capacity of 110,000 barrels per day. The oil company indicates that diluted bitumen produced from Kearl will have about the same life-cycle GHG emissions as many other crude oils refined in the U.S. thanks to technologies that significantly enhance environmental performance. These technologies include cogeneration for steam and electricity production, and a low-energy extraction process to recover bitumen.

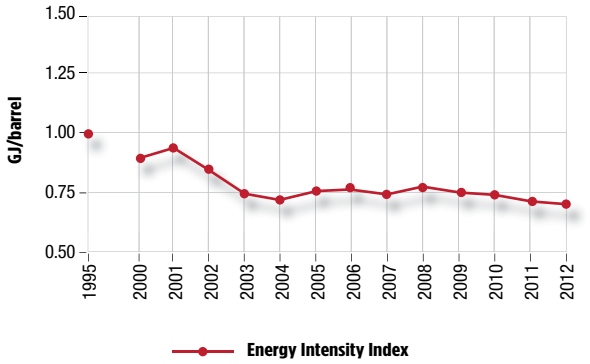
Over the lifetime of the project, Imperial Oil will rely on energy audits and benchmarking performance measurements to further improve efficiencies and reduce emissions.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5259.

HIGHLIGHTS

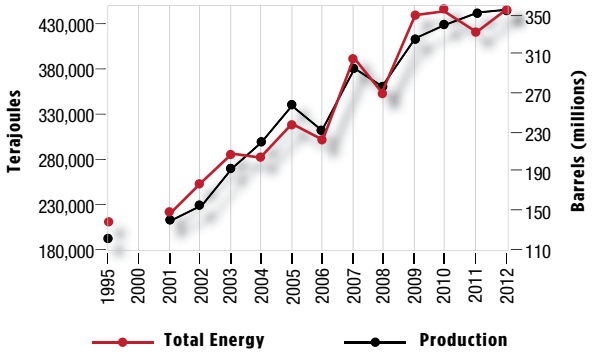
Oil Sands Sector – NAICS 211114

Energy Intensity Index (1995-2012) Base Year 1995 = 1.00



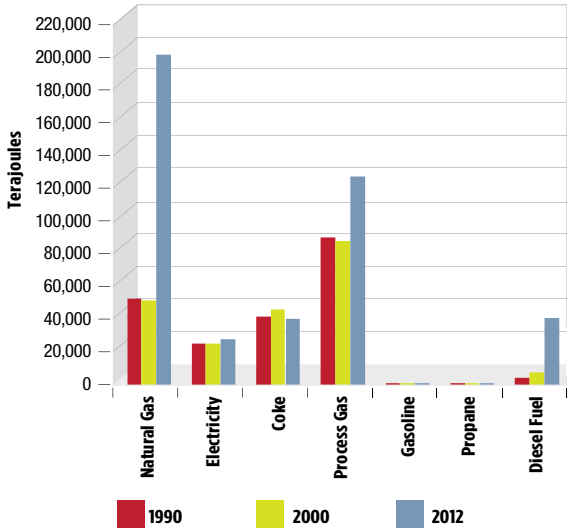
Energy intensity decreased by 3.66 percent between 2011 and 2012.

Total Energy and Physical Output (1995-2012)



Between 2011 and 2012, total energy consumption increased by 3.9 percent and total production increased by 7.85 percent.

Energy Sources



Electricity consumption increased by 5.44 percent while diesel fuel consumption decreased by 5.54 percent between 2011 and 2012.

Data source

Energy Resources Conservation Board, 2012. (Fort McMurray office). Data excludes in-situ production.

Petroleum Products

PROFILE

Canada's petroleum products sector manufactures and markets the fuels that drive the Canadian economy. From transportation fuels to heating oil, chemicals and asphalt, its products are present in many aspects of Canadian daily activities. The refining sector contributes $6 billion to Canada's GDP annually and employs 100,000 Canadians at 18 refineries, 21 primary fuel distribution terminals and about 12,000 wholesale and retail service stations throughout Canada.[13]

ACHIEVEMENTS

Increasing energy efficiency in Ontario and Alberta Imperial Oil refineries

Imperial Oil recently conducted the most complex turnaround in the history of its Strathcona refinery near Edmonton. In petroleum refining, a turnaround involves shutting down operations to conduct maintenance on, upgrade or replace equipment or facilities that must operate continuously. During the turnaround at Strathcona, the company upgraded equipment to increase energy efficiency and lower GHG emissions. The upgrades included new technology to reduce particulate emissions that affect air quality.

At Imperial Oil's Nanticoke refinery, on the north shore of Lake Erie, Ont., the company continues to examine ways to produce petroleum fuels and other products while using as little energy as possible. According to Imperial Oil, Nanticoke is one of the most energy-efficient refineries in North America. The site recently made structural improvements that will help reduce the

[13] Canadian Fuels Association

amount of fuel gas produced during refinery operation. Recent energy-saving initiatives such as this have improved efficiency by 0.7 percent – equal to the annual energy use of about 1,350 Canadian households.

Shell's energy management program

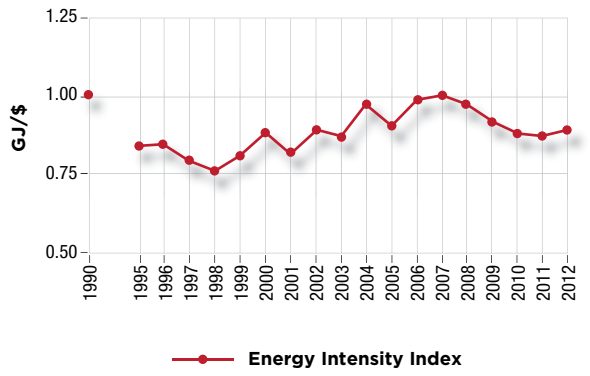
For Shell, a 1 percent improvement in energy efficiency is equal to $5 million to $7 million savings per manufacturing site – including those in Sarnia, Ont. and Scottford, Alta. The company continues to work on improving energy efficiency at its oil and gas production projects, oil refineries and chemical plants. Shell has a CO_2 and energy management program that continuously monitors the energy efficiency of its equipment. These systems give Shell instant information that can be used to make energy-saving changes. Used across 20 Shell manufacturing sites, this monitoring system contributed to savings of more than $20 million in 2013.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5277.

HIGHLIGHTS

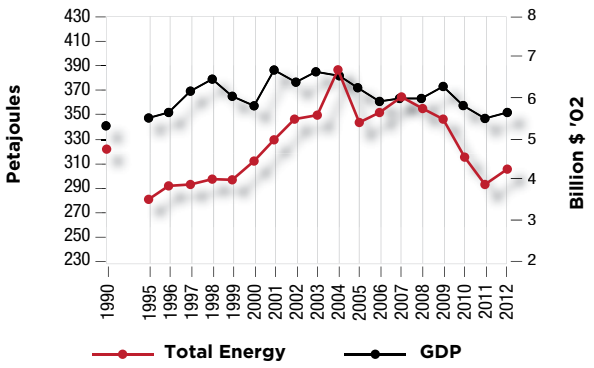
Petroleum Products Sector – NAICS 324110

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



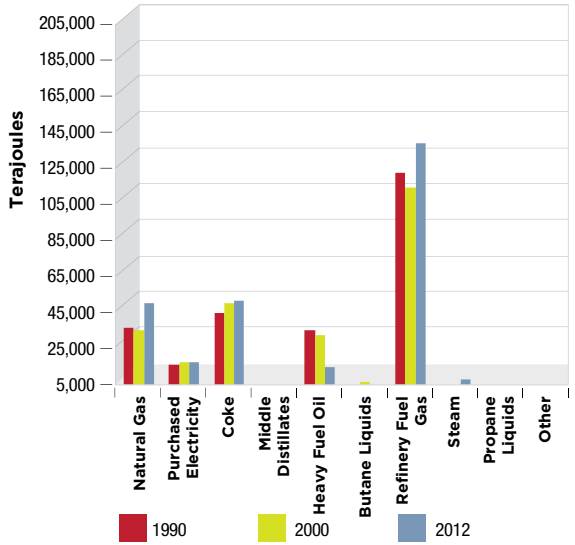
Between 2011 and 2012, energy intensity increased by 1.06 percent.

Total Energy and Economic Output (1990-2012)



GDP increased by 2.32 percent and energy consumption increased by 3.41 percent between 2011 and 2012.

Energy Sources



Between 2011 and 2012, natural gas consumption increased by 2.02 percent, heavy fuel oil consumption increased by 2.31 percent while refinery fuel gas consumption decreased by 7.98 percent.

Data source

Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. March 2014.

Plastics

PROFILE

Canada's $29.2 billion plastics industry is sophisticated and multi-faceted and encompasses manufacturing, machinery, moulds and resins. Represented by the Canadian Plastics Industry Association (CPIA), the sector comprises 3,170 companies that employ more than 95,400 workers.[14]

The CPIA focuses on three priorities. The association prides itself on communicating the facts behind plastics' manufacturing and use – from the material's economic, social and environmental contributions to the size and strength of the Canadian manufacturing sector. It is committed to increasing the amount of plastic and the various types of plastic waste being diverted from landfill by using various waste management options, such as reuse, recycle and energy recovery. And, the CPIA remains committed to building on the industry's long history of innovation and achievement by taking advantage of new opportunities and meeting industry challenges as they arise.

ACHIEVEMENTS

Polar Pak undergoes lighting and compressor retrofit

Polar Pak manufactures foodservice, bakery and produce packaging at its plant in Brampton, Ont. Recently, the company retrofitted all lighting in its tool and die plant to improve the quality of light and reduce energy use. For example, all existing metal halide, T-12 fluorescent and Par75R40 flood lamp fixtures were replaced with more energy-efficient units. The company also installed motion sensors in low-traffic areas to turn lights off when not required.

[14] Canadian Plastics Industry Association

These upgrades are expected to save about 39,700 kWh of electricity annually – a reduction of 65 percent compared to previous lighting. The company also reports that the improved quality of light provides a safer working environment and improves overall productivity.

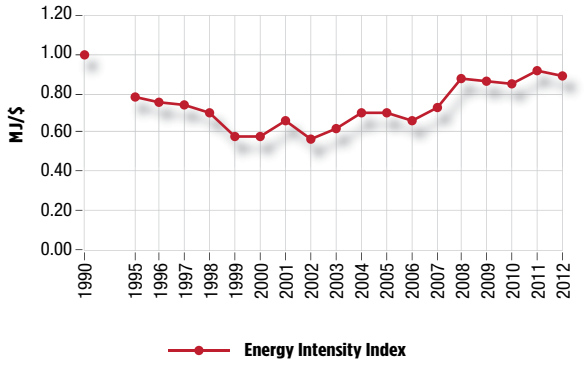
Polar Pak also installed a new high-efficiency compressor in one of its thermoforming plants. The unit's variable-speed drive motor and entrance air-cooling system have contributed to a 35 percent overall reduction in energy consumption, including an annual reduction of 345,100 kWh in electricity use. Heat recovered from the compressor is expected to reduce natural gas consumption by more than 100,000 m^3 per year.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5269.

HIGHLIGHTS

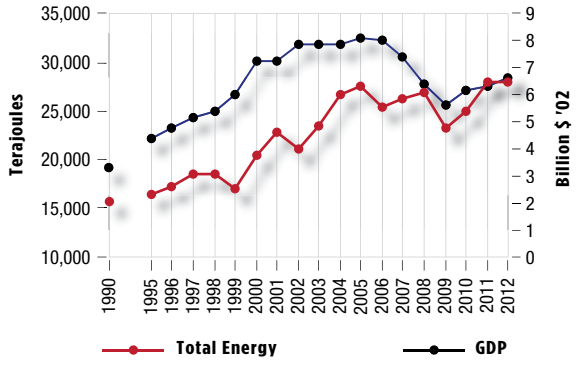
Plastics Sector – NAICS 3261

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



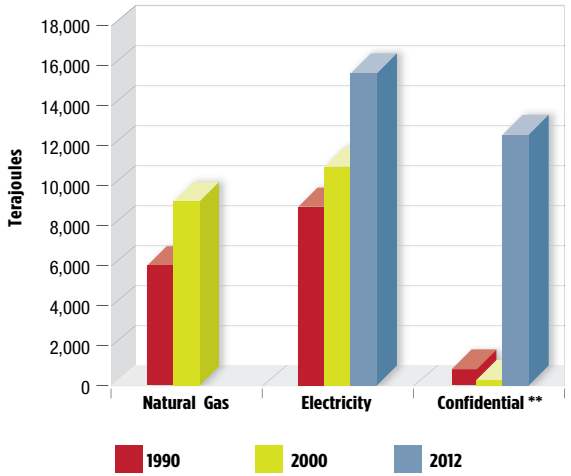
Between 2011 and 2012, energy intensity decreased by 3.8 percent.

Total Energy and Economic Output (1990-2012)



GDP increased by 4.3 percent and energy consumption increased by 0.4 percent between 2011 and 2012.

Energy Sources



** Confidential includes natural gas, heavy fuel oil, middle distillates and propane.

Electricity consumption increased by 2.1 percent between 2011 and 2012.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – GDP – Informetrica Limited, *T1 Model and National Reference Forecast*, January 2014.

Steel

PROFILE

With $12 billion to $14 billion in annual sales, Canada's steel industry is at the root of the Canadian industrial tree, providing the key material for many industries, including automotive, construction, energy, packaging and advanced manufacturing. Steel is also an important customer for many other industries, including raw materials and transportation.[15]

There are two major ways to produce steel in Canada: the basic oxygen furnace (BOF) process and the electric arc furnace (EAF) process. These two processes have different energy profiles. The BOF process uses raw materials (notably iron ore and coal), combined with 25 to 35 percent recycled steel to make new steel. The EAF process uses almost 100 percent recycled steel to make new steel.

Both processes produce different products for a wide spectrum of applications. While the steel industry maximizes its consumption of available recycled steel to make new steel, additional demand for steel products cannot be fully met through finite scrap steel supplies. In 2012, Canadian steel producers recycled 7 million t of steel.

ACHIEVEMENTS

ArcelorMittal Dofasco's innovation and sustainability awards

ArcelorMittal's Dofasco plant in Canada took home the Innovation of the Year and Excellence in Sustainability awards at the World Steel Association's 47th annual conference in October 2013. The innovation award recognizes Dofasco's KOBM (Klockner oxygen blown maxhutte [furnace]) steelmaking project. Launched in 2002, the project has fully automated Dofasco's KOBM steelmaking sequence. Automation has improved product quality, reduced production time, and reduced health and safety risks.

[15] Canadian Steel Producers Association – *Steel Facts*

The Excellence in Sustainability award recognizes ArcelorMittal's work to sustain, restore and protect fish, wildlife and habitat in the Great Lakes basin. With nine facilities on the basin, the company relies on a healthy watershed for production, processing and shipping.

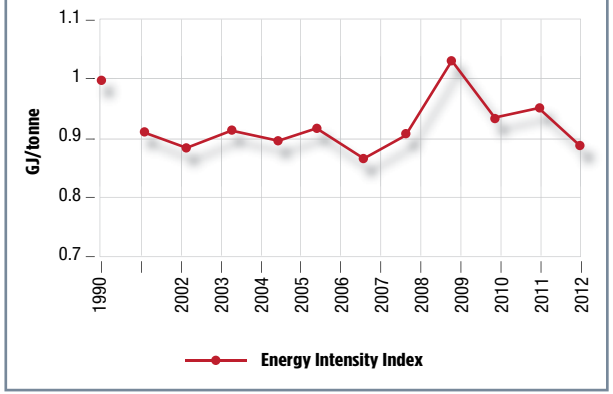
ArcelorMittal's efforts to improve the sustainability of steelmaking also target energy. Given that electricity is the company's third largest input cost, the business case for sound energy management is clear. ArcelorMittal established a business-wide energy policy to reduce energy consumption and improve efficiency. The policy has given rise to several projects to reduce demand on Ontario's power grid. In one project, the company installed a turbine generator that reduces the company's reliance on the grid by about 4 MW of electricity annually.

For more information on the sector, visit oee.nrcan.gc.ca/industrial/opportunities/cipec/meetings/steel/login.cfm.

HIGHLIGHTS

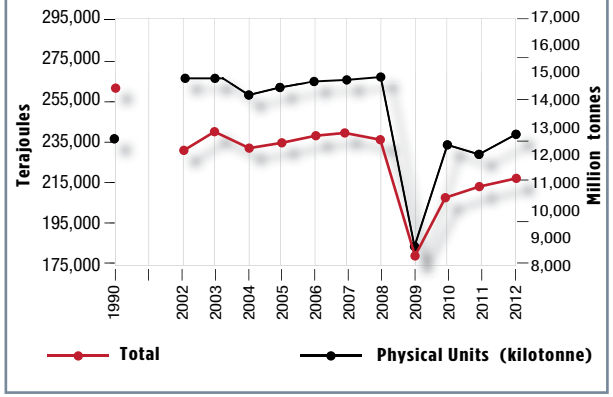
Steel Sector – NAICS 331100

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



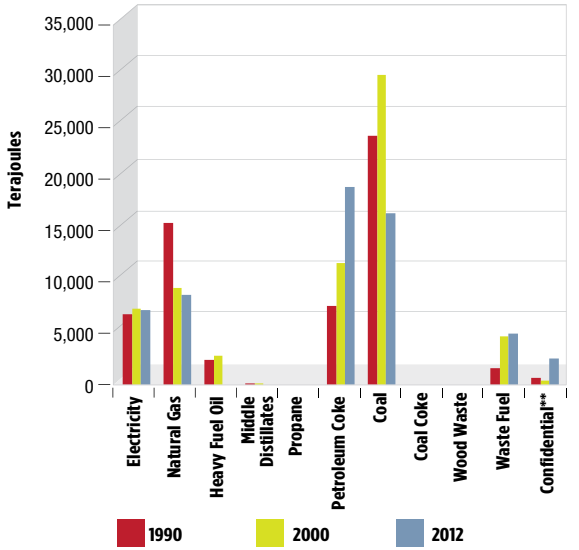
Between 2012 and 2013, energy intensity improved by 3.8 percent.

Total Energy Consumption and Physical Output (1990-2012)



Energy consumption increased by 1.9 percent and production increased by 5.9 percent.

Energy Sources



** Confidential includes natural gas, heavy fuel oil, petroleum coke, and coal

Data source

Energy Use – Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC). Simon Fraser University. March 2014.

Transportation Equipment Manufacturing

PROFILE

Canada's transportation equipment manufacturing sector comprises two primary industries: automotive and aerospace manufacturing.

Canada is the ninth largest vehicle producer in the world and employs more Canadians than any other manufacturing industry.

The industry directly supports more than 550,000 jobs across the country in 11 light-duty and 3 heavy-duty assembly plants, more than 540 original equipment parts manufacturers, about 4,000 dealerships and many other directly related industries.

The Canadian vehicle assemblers are highly competitive, accounting for close to 4 percent of total world production of 68.6 million units and a global trade surplus in finished vehicles of more than $13.8 billion.

The Canadian automotive industry is a leader in the development of a highly skilled workforce and in its efforts to improve environmental quality and is a major contributor to the health of Canada's economy.[16]

Aerospace manufacturing

Canada ranks third in global civil aircraft production thanks to an aerospace manufacturing industry that includes civil and defence activities as well as space systems manufacturing. Employing more than 172,000 Canadians, the industry is a market leader in the production of aircraft, rotorcraft, avionics, engines, simulation systems and other aerospace components.

The industry comprises more than 700 companies that generated $25.1 billion in direct revenues in 2013. About 80 percent of industry products are exported each year to highly diversified markets around the world. More than 20 percent of industry activity is dedicated to R&D – five times the Canadian average for total manufacturing intensity.[17]

[16] Canadian Vehicles Manufacturing Association (CVMA)
[17] *The State of the Canadian Aerospace Industry*. Aerospace Industries Association of Canada. 2014.

ACHIEVEMENTS

Chrysler Brampton plant achieves ISO 50001 certification

Chrysler Canada's Brampton, Ont. facility has become the first automotive assembly plant in Canada to be ISO 50001 certified. The plant was named winner of the CIPEC 2014 Leadership Award for Corporate Stewardship in part for the certification and the resulting achievements in energy efficiency.

Recent energy management projects include installation of a programmable logic controller for paint shop lighting and implementation of a system to improve efficiency of the chilled water system. The company also replaced control panels with new smart systems that have improved heating, ventilation and exhaust systems throughout the plant. A 9 percent improvement in space heating efficiency has contributed to annual energy savings of more than $2 million since 2013.

The Brampton facility served as the pilot for ISO 50001 certification among Chrysler's North American assembly plants. The company's other plants are expected to achieve certification by the end of 2014.

Bombardier 2013 energy conservation achievements

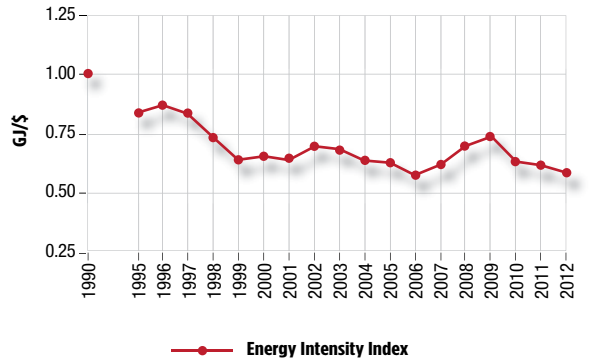
Energy efficiency has paid off for Bombardier. The company reduced energy consumption by 11 percent and GHG emissions by 23 percent between 2009 and 2013, based on 2008 data. One project that contributed to improved energy use took place at the company's Mirabel site, where a pressure differential damper was added to optimize the flue gas management of the boilers.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5273.

HIGHLIGHTS

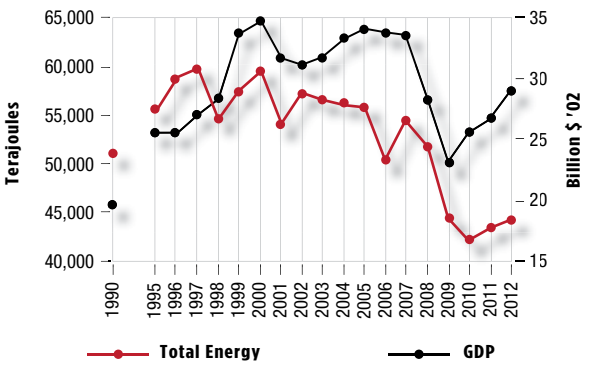
Transportation Equipment Manufacturing – NAICS 336

Energy Intensity Index (1990-2012) Base Year 1990 = 1.00



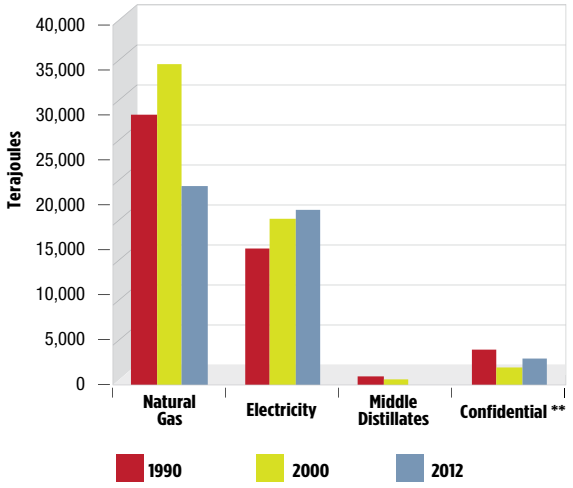
Between 2011 and 2012, energy intensity decreased by 6.9 percent.

Total Energy and Economic Output (1990-2012)



GDP increased by 9.2 percent and energy consumption increased by 1.6 percent between 2011 and 2012.

Energy Sources



** Confidential includes coal, steam, propane, middle distillate, heavy fuel oil, and wood.

Between 2011 and 2012, natural gas consumption deceased by 0.2 percent while electricity consumption increased by 4.1 percent.

Data sources

Energy Use – Statistics Canada, *Industrial Consumption of Energy Survey 1990, 1995-2012*, Ottawa. January 2014.

Production – GDP – Informetrica Limited, *T1 Model and National Reference Forecast,* January 2014.

Upstream Oil and Gas

PROFILE

The upstream oil and gas sector includes companies that find and develop Canada's vast oil and gas resources. The sector is broadly divided between conventional oil and gas production and oil sands production and upgrading. This section discusses the conventional oil and gas sector. The oil sands sector is covered separately in this annual report.

Products and services derived by downstream sectors from the output of this industry include heating and transportation fuels, building supplies and materials, clothing and medicines.

The exploration and production industry is represented by the Canadian Association of Petroleum Producers (CAPP) and the Explorers and Producers Association of Canada. CAPP represents both large and small companies that explore, develop and produce natural gas and crude oil throughout Canada. CAPP's member companies produce about 90 percent of Canada's natural gas and crude oil. CAPP's associate members provide a wide range of services that support the upstream crude oil and natural gas industry. Together, CAPP members and associate members are an important part of a national industry with revenues of about $110 billion per year.[18]

ACHIEVEMENTS

Systematic energy efficiency program leads to significant GHG reductions

ConocoPhillips Canada has embarked on a company-wide energy efficiency program that will reduce GHG emissions by 126,770 t of carbon-dioxide equivalent (CO_2e) by 2020. The project will cost just over $14 million, with $7 million coming from the Alberta's Climate Change and Emissions Management Corporation (CCEMC) technology fund.

The ConocoPhillips project will focus on 10 technologies to improve energy efficiency in about 400 of its facilities. Knowledge sharing is pivotal to the project. By showcasing how

[18] Canadian Association of Petroleum Producers (CAPP)

a major energy player can combine energy and economic efficiency, the CCEMC hopes to see other large corporations launch similar strategic initiatives.

Vent gas capture for engine fuel use

With CCEMC funding, Encana Corporation aims to improve the energy efficiency of more than 50 of its compressor engines in Alberta. The company will install SlipStream® technology to capture methane that is currently being vented into the atmosphere. The process will redirect the natural gas and use it to help fuel the compressors. Expected to be one of the first field implementations of this technology, the project has the potential to reduce emissions by 548,614 t of CO_2e by 2020.

Zero-emission well site demonstration project

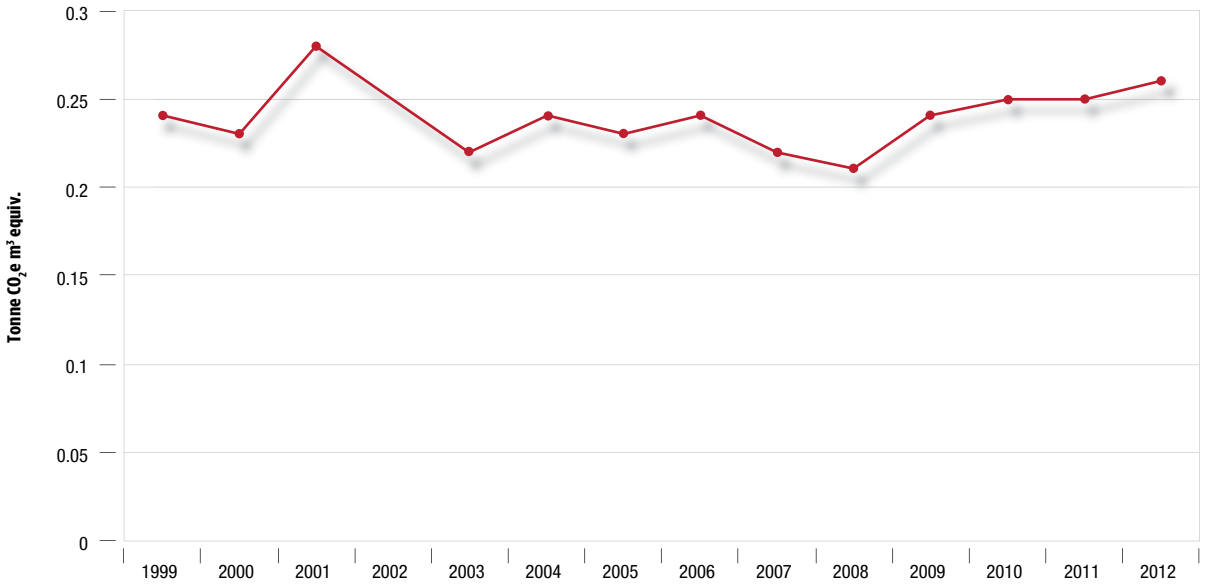
Encana also tested the potential of new well equipment at a site near Three Hills, Alta. in 2013. The project involved replacing the existing pneumatic methanol pump with a zero-emissions, solar-electric system. After the initial learning curve during the first month of operations, the system operated reliably throughout the winter of 2012–2013. Although economics are a challenge for retrofits, the results were encouraging. Encana estimates the costs of a zero-emission, low-energy well site system could be competitive for new builds if the comparable design requires a thermoelectric generator, fuel cell or larger solar/battery pack. The company indicates that installation costs could be reduced by assembling the systems before delivery to the well site.

For more information on the sector, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5263.

HIGHLIGHTS

Upstream Oil and Gas Sector – NAICS 211113

GHG Emission Intensity - Conventional Oil and Gas



Between 2011 and 2012, GHG emissions intensity increased by 2.45 percent.

The oil and gas industry's objective is to decrease the overall intensity of GHG emissions per unit of energy produced over time, largely through the development and implementation of new technologies. There is increasing focus on accelerating the pace of innovation to improve environmental performance, including GHG emissions intensity.

Data source

The CAPP Responsible Canadian Energy Report 2013 – Canadian Association of Petroleum Producers

CIPEC Who's Who

CIPEC EXECUTIVE BOARD MEMBERS

The executive board provides leadership for CIPEC's task forces, associations and companies. The board's 10 members are all volunteers with senior management responsibilities and expertise in energy efficiency. They are drawn from across the 21 CIPEC sectors. The executive board has regular teleconferences and meetings throughout the year.

CIPEC TASK FORCE COUNCIL MEMBERS

The 26-member CIPEC Task Force Council includes volunteer representatives from each of CIPEC's 21 sectors. Members of the Task Force Council benefit from the energy efficiency expertise offered by their council peers. They meet regularly to exchange ideas and recommend ways to address the challenges associated with improving energy efficiency and sustainability as well as reducing GHG emissions.

CIPEC LEADERS

CIPEC Leaders are drawn from CIPEC member companies and trade associations. Every member has access to tools and services offered by NRCan's OEE. CIPEC Leaders support voluntary initiatives that lead to energy cost savings and assist the Government of Canada in meeting its objectives to save energy and reduce GHG emissions and air pollution. Every two years, member companies are invited to compete in the CIPEC Leadership Awards showcasing their energy efficiency achievements. The awards are presented during CIPEC's biennial conference.

OFFICE OF ENERGY EFFICIENCY INDUSTRY DIVISION CONTACTS

Contact information for the Program's director, chiefs, general enquiries and Dollars to $ense Energy Management workshops program.

CIPEC Executive Board Members

Andy Mahut (Chair)
Manager
Energy Practices
U.S. Steel Canada Inc.

Martin Vroegh
Ex-officio member – Chair, CIPEC Task Force Council
Director, Environmental Affairs, Cement
St. Marys Cement Inc.

Helen Bennett
Emerging Regulatory Policy Issue Advisor
Shell Canada Downstream – Sarnia Manufacturing Centre

Wayne Kenefick
Vice-president
Sustainable Development
Graymont Western Canada Inc.

Peter Kinley
President and CEO
Lunenburg Industrial Foundy & Engineering

Walter Kraus
Vice-president
Environmental Sustainability
Weston Food Canada Inc. - Etobicoke

Yves Leroux
Vice-president
Regulatory and Government Affairs
Parmalat Dairy & Bakery Inc.

Ronald C. Morrison
Treasurer of the Board
Canadian Manufacturers & Exporters

George T. Partyka
Vice-president
Partner Technologies Incorporated

Bradley Robertson
Senior Continuous Improvement Leader
ESCO Limited –Port Hope

CIPEC Task Force Council Members

CIPEC TASK FORCE COUNCIL CHAIR

Martin Vroegh
Director
Environmental Affairs
Cement St. Marys Cement Inc.

ALUMINUM SECTOR TASK FORCE

Anik Dubuc
Vice-president
Sustainable Development
Aluminium Association of Canada (AAC)

BREWERY SECTOR TASK FORCE

Edwin Gregory
Director
Policy and Research
Beer Canada

CEMENT SECTOR TASK FORCE

Adam J. Auer
Director
Sustainability Business Development and Stakeholder Relations
Cement Association of Canada (CAC)

CONSTRUCTION SECTOR TASK FORCE

Ken Lancastle
Associate Director
Communications and Technology
Canadian Construction Association (CCA)

DAIRY SECTOR TASK FORCE

Tim Whitson
Energy Project Engineer
Natrel Division, Agropur Cooperative

DATA SPECIALIST

Susan Olynyk
Senior Specialist, Climate Change
Environmental Department
ArcelorMittal Dofasco Inc.

ELECTRICAL AND ELECTRONICS SECTOR TASK FORCE

Jim Taggart
President & Chief Executive Officer
Electro-Federation Canada

ELECTRICITY GENERATION SECTOR TASK FORCE

Channa S. Perera
Manager
Sustainable Electricity Program
Canadian Electricity Association (CEA)

FERTILIZER SECTOR TASK FORCE

Giulia Brutesco
Director
Scientific and Regulatory Affairs
Canadian Fertilizer Institute (CFI)

FOOD AND BEVERAGE SECTOR TASK FORCE

CIPEC Task Force Council Vice-chair
Doug Dittburner
Manager, Power Services
Campbell Company of Canada

FOREST PRODUCTS SECTOR TASK FORCE

Robert (Bob) Larocque
Director
Environment, Energy, Economics and Climate Change
Forest Products Association of Canada

FORESTRY SECTOR CONTACT

Jan Michaelsen
Program Leader
Transport and Energy
FPInnovations

FOUNDRY SECTOR TASK FORCE

Judith Arbour
Executive Director
Canadian Foundry Association (CFA)

GENERAL MANUFACTURING SECTOR TASK FORCE – ATLANTIC REGION

Peter Kinley
President and CEO
Lunenburg Industrial Foundry & Engineering

GENERAL MANUFACTURING SECTOR TASK FORCE – CENTRAL ONTARIO

Jim Armstrong
Environment, Health and Safety Specialist
Crown Metal Packaging Canada LP

GENERAL MANUFACTURING SECTOR TASK FORCE – EASTERN ONTARIO

Michael Kelly
Energy Manager
KI Pembroke LP

LIME SECTOR TASK FORCE

Christopher Martin
Regional Environmental Manager
Carmeuse Lime (Canada) – Beachville Operation

MINING SECTOR TASK FORCE

Brendan Marshall
Director
Economic Affairs
The Mining Association of Canada (MAC)

MINING SECTOR TASK FORCE – CO-CHAIR

Russell Blades
Manager
R&D – Energy & GHG
Barrick Gold Corporation

PETROLEUM PRODUCTS SECTOR TASK FORCE

Gilles Morel
Director
Eastern Canada and National
Canadian Fuels Association

PIPELINES SECTOR TASK FORCE

Bill Tubbs
Climate Change and Energy Efficiency Specialist
Spectra Energy

STEEL SECTOR TASK FORCE

Jennifer Stephens
Director
Environment
Canadian Steel Producers Association

TRANSPORTATION EQUIPMENT MANUFACTURING SECTOR TASK FORCE

Michael O'Meara, P. Eng., C.E.M.
Senior Specialist
Environmental Compliance and Energy
Magna International Inc.

UPSTREAM OIL AND GAS SECTOR TASK FORCE

James Callendar
Environmental Engineer
Encana Environmental Innovation Fund
Encana Corporation

EMC REPRESENTATIVE

Scott McNeil-Smith
Director
Marketing and Development
EMC Canada

CIPEC Leader Companies by Sector

ALUMINUM

Alcan inc. – *Montréal*

Alcan Specialty Aluminas – *Brockville*

Alcoa Canada Première fusion – *Montréal*

- Alcoa ltée – Aluminerie de Baie-Comeau – *Baie-Comeau*
- Alcoa – Aluminerie de Deschambault S.E.N.C. – *Deschambault*
- Alcoa Ltée – Alcoa-Usine de Tige – *Bécancour*
- Aluminerie de Bécancour inc. – *Bécancour*

Almag Aluminum Inc. – *Brampton*

Alumicor Limited – *Toronto*

Aluminerie Alouette inc. – *Sept-Îles*

Novelis Inc. – *Toronto*

Recyclage d'aluminium Québec inc. – *Bécancour*

Universal Stainless & Alloys Inc. – *Mississauga*

BREWERY

Big Rock Brewery Ltd. – *Calgary*

Columbia Brewery – *Creston*

John Allen Brewing Company (The) – *Halifax*

Labatt Breweries of Canada – *Edmonton, London, St. John's, Toronto*

- La Brasserie Labatt – *LaSalle*

Les Brasseurs du nord inc. – *Blainville*

Molson Coors Canada – *Moncton, Montréal, Ontario, Vancouver*

Moosehead Breweries Limited – *Saint John*

Pacific Western Brewing Company – *Prince George*

Rahr Malting Canada Ltd. – *Alix*

Sleeman Brewing and Malting Co. Ltd. – *Guelph*

- Okanagan Spring Brewery – *Vernon (Sleeman)*
- Sleeman Maritimes – *Dartmouth*
- Sleeman Unibroue Quebec – *Chambly*

CEMENT

Advanced Precast Inc. – *Bolton*

Arriscraft International – *Cambridge*

ESSROC Canada Inc. – *Picton*

Gordon Shaw Concrete Products Ltd. – *Windsor*

Groupe Permacon – *Ville d'Anjou*

- Decor Precast – Div. of Oldcastle Building Products Canada – *Stoney Creek*
- Groupe Permacon Div. des Matériaux de Construction Oldcastle Canada Inc. – *Ville d'Anjou*
- Groupe Permacon inc. – Division Trois-Rivières – *Trois-Rivières*
- Groupe Permacon (Sherbrooke) – Div. des Matériaux de Construction Oldcastle Canada inc. – *Sherbrooke*
- Permacon Group Inc. – *Bolton, Oshawa*
- Permacon Group – *Milton*
- Permacon Ottawa – *Stittsville*

Holcim (Canada) Inc. – *Joliette, Mississauga*

International Erosion Control Systems – *Rodney, West Lorne*

Lafarge Canada inc. – *Montréal, Winnipeg*

Lehigh Inland Cement Limited – *Edmonton*

Lehigh Northwest Cement Limited – *Richmond*

Pre-Con Inc. – *Brampton*

St. Marys Cement Inc. (Canada) – *Bowmanville*

CHEMICALS

Abrex Paint & Chemical Ltd. – *Oakville*

APCO Industries Co. Limited – *Toronto*

Apotex Pharmachem Inc. – *Brantford*

Arclin Canada Ltd. – *North Bay*

Avmor Ltée – *Laval*

Banner Pharmacaps (Canada) Ltd. – *Olds*

Bartek Ingredients Inc. – *Stoney Creek*

Becker Underwood – *Saskatoon*

Benjamin Moore & Cie Limitée – *Montréal*

Big Quill Resources Inc. – *Wynyard*

BioVectra Inc. – *Charlottetown*

BOC Gaz – *Magog*

Celanese Canada inc. – *Boucherville*

Charlotte Products Ltd. – *Peterborough*

Church & Dwight Canada – *Mount Royal*

Colgate-Palmolive Canada Inc. – *Mississauga*

Collingwood Ethanol L.P. – *Collingwood, Toronto*

Commercial Alcohol Inc. – *Chatham, Tiverton, Varennes*

Diversey Canada, Inc. – *Edmonton*

Dominion Colour Corporation – *Ajax, Toronto*

Eka Chimie Canada inc. – *Magog, Salaberry-de-Valleyfield*

Eli Lilly Canada Inc. – *Scarborough*

Emery Oleochemicals Canada Ltd. – *Toronto*

Estée Lauder Cosmetics Ltd. – *Scarborough*

Evonik Degussa Canada Inc. – *Brampton, Burlington, Gibbons*

Fibrex Insulations Inc. – *Sarnia*

Fielding Chemical Technologies Inc. – *Mississauga*

Galderma Production Canada inc. – *Baie d'Urfé*

Germiphene Corporation – *Brantford*
Grace Canada inc. – *Valleyfield*
GreenField Ethanol Inc. – *Tiverton*
Honeywell – *Amherstburg*
Hostmann-Steinberg Limited – *Brampton*
HP Polymers Ltd. – *Puslinch*
ICI Canada Inc. – *Concord*
International Group Inc. (The) – *Toronto*
Jamieson Laboratories Ltd. – *Windsor*
Kronos Canada Inc. – *Varennes*
Lanxess Inc. – *Sarnia*
L'Oréal Canada inc. – *Montréal*
Les Emballages Knowlton inc. – *Knowlton*
Mancuso Chemicals Limited – *Niagara Falls*
Nalco Canada Co. – *Burlington*
Nordion Inc. – *Ottawa*
NOVA Chemicals Corporation – *Corruna, Joffre, Moore Township, St. Clair River*
Oakside Chemicals Limited – *London*
OmegaChem inc. – *Lévis, Saint-Romuald*
Orica Canada Inc. – *Brownsburg*
Osmose-Pentox Inc. – *Montréal*
Oxy Vinyls Canada Inc. – *Niagara Falls*
Pharmascience inc. – *Montréal*
PolyOne Canada Inc. – *Orangeville*
Powder Tech Ltd. – *Brampton*
PPG Canada Inc. – *Beauharnois*
Procter & Gamble Inc. – *Brockville*
Prolab Technologies Inc. – *Thetford Mines*
Purdue Pharma – *Pickering*
Rhema Health Products Limited – *Coquitlam*
Rohm and Haas Canada Inc. – *Scarborough*
Sanofi Pasteur Limited – *North York*
Saskatchewan Minerals Inc. – *Chaplin*
Sifto Canada Corp. – *Goderich, Unity*
Solucor Ltd. – *Bradford*
Soucy Techno inc. – *Sherbrooke*
Tech Blend s.e.c. – *Saint-Jean-sur-Richelieu*
Technical Adhesives Ltd. – *Mississauga*
Tri-Tex Co. Inc. – *Saint-Eustache*
Trillium Health Care Products Inc. – *Brockville, Newmarket, Perth, Prescott*
Westbrook Technologies Inc. – *Scarborough*
Wyeth-Ayerst Canada Inc. – *Saint-Laurent*

CONSTRUCTION

AnMar Mechanical & Electrical Contractors Ltd. – *Lively*
ATCO Structures Inc. – *Calgary, Spruce Grove*
Basin Contracting Limited – *Enfield*
Battle River Asphalt Equipment Ltd. – *Cut Knife*
Construction DJL Inc. – *Saint-Philippe-de-Laprairie*
Denko Mechanical Ltd. – *Springfield*
Lockerbie & Hole Industrial Inc. – *Edmonton*
M J Roofing & Supply Ltd. – *Winnipeg*
Mira Timber Frame Ltd. – *Stony Plain*
Moran Mining & Tunnelling Ltd. – *Lively*
Northland Building Supplies Ltd. – *Edmonton*
Pavages Beau-Bassin, division de Construction DJL Inc. – *Gaspé*
Production Paint Stripping Ltd. – *Toronto*
Taggart Construction Ltd. – *Ottawa*
Whitemud Ironworks Group Ltd. – *Edmonton*

DAIRY

Agrilait Coopérative agricole – *Saint-Guillaume*
Agropur Coopérative – *Beauceville*
Agropur Coopérative, divison Natrel – *Don Mills*
Amalgamated Dairies Limited – *Summerside*
- ADL O'Leary – *Summerville*
- ADL St. Eleanors – *Summerside*
- ADL West Royalty – *Charlottetown*
- O'Leary and Perfection Foods – *Summerside*

Arla Foods Inc. – *Concord*
Atwood Cheese Company – *Atwood*
Baskin-Robbins Ice Cream – *Peterborough*
Entreprise Le Mouton Blanc – *La Pocatière*
Farmers Co-Operative Dairy Limited – *Halifax*
Foothills Creamery Ltd. – *Calgary, Didsbury, Edmonton*
La Fromagerie Polyethnique inc. – *Saint-Robert*
Hewitt's Dairy Limited – *Hagersville*
Kerry Québec Inc. – *Sainte-Claire*
Laiterie Chagnon Ltée – *Waterloo*
Laiterie Charlevoix inc. – *Baie-Saint-Paul*
Neilson Dairy Ltd. – *Halton Hills, Ottawa*
Nutrinor (Laiterie Alma) – *Alma*
Parmalat Dairy & Bakery Inc. – *Etobicoke*
- Parmalat Canada Inc. – *Brampton*

Pine River Cheese & Butter Co-operative – *Ripley*
Roman Cheese Products Limited – *Niagara Falls*
Salerno Dairy Products Ltd. – *Hamilton*
Saputo inc. – *Montréal*
- Saputo Cheese, G.P. – *Saint-Léon*
- Saputo Foods Limited – *Tavistock*

S.C.A. de L'île-aux-Grues – *L'Île-aux-Grues*
Silani Sweet Cheese Ltd. – *Schomberg*

ELECTRICAL and ELECTRONICS

ABB Inc. – *Lachine, Québec, Saint-Laurent, Varennes*
ABB Bomem Inc. – *Québec*
Alstom Hydro Canada Inc. – *Sorel-Tracy*
Apollo Microwaves – *Pointe-Claire*
ASCO Valve Canada – *Brantford*
Best Theratronics Ltd. – *Ottawa*
C-Vision Limited – *Amherst*
Candor Industries Inc. – *Toronto*
Chamber Électrique - *Yamaska*
Circuits GRM Enr. – *Ville Saint-Laurent*
Crest Circuit Inc. – *Markham*
Cogent Power Inc. – *Burlington*
DALSA Semiconducteur Inc. – *Bromont*
DRS Technologies Canada Ltd. – *Carleton Place*

Duke Electric Ltd. – *Hamilton*
Duplium Corporation – *Thornhill*
Eaton Yale Company – *Milton*
Éclairages PA-CO inc. (Les) – *Laval*
Ecopower Inc. – *London*
Electrolux Canada Corp. – *L'Assomption*
Energizer Canada Inc. – *Walkerton*
EPM Global Services Inc. – *Markham*
Firan Technology Group – *Scarborough*
General Electric Canada – *Peterborough*
General Dynamics Canada – *Calgary, Ottawa*
GGI International – *Lachine*
Hammond Manufacturing Company Limited – *Guelph*
Honeywell – *Mississauga*
IBM Canada Ltd. – *Bromont, Markham*
Ideal Industries (Canada) Corp. – *Ajax*
ISAAC Instruments Inc. – *Chambly*
Master Flo Technology Inc. – *Hawkesbury, North Vancouver*
MDS Nordion Inc. – *Kanata*
Mersen Canada Toronto, Inc. – *Toronto*
Milplex Circuit (Canada) Inc. – *Scarborough*
Moloney Electric Inc. – *Sackville, Spruce Grove, Toronto*
Nexans Canada Inc. – *Fergus*
Osram Sylvania Ltd. – *Mississauga*
Osram Sylvania ltée – *Drummondville*
Partner Technologies Incorporated – *Regina*
Pivotal Power Inc. – *Bedford*
Powersmiths International Corp. – *Brampton*
Proto Manufacturing Ltd. – *Oldcastle*
Purifics ES Inc. – *London*
Ralston Metal Products Ltd. – *Guelph*
Real Time Systems Inc. – *Toronto*
Remco Solid State Lighting – *Toronto*
Rheinmetall Canada inc. – *Saint-Jean-sur-Richelieu*
Rockwell Automation Canada Inc. – *Cambridge*
S&C Electric Canada Limited – *Toronto*
Schneider Electric Canada Inc. – *Saanichton*
Southwire Canada – *Stouffville*
Surrette Battery Company Limited – *Springhill*
Systèmes Électroniques Matrox Ltée – *Dorval*
Tyco Electronics Canada Ltd. – *Markham*
Tyco Safety Products – *Toronto*
Tyco Thermal Controls Canada Limited – *Trenton*
Ultra Electronics Maritime Systems – division of Canada Defence Inc. – *Dartmouth*
Vansco Electronics Ltd. – *Winnipeg*
Wipro Technologies – *Mississauga*

ELECTRICITY GENERATION

Enwave energy Corporation
- Pearl Street Plant – *Toronto*
- Simcoe Street Plant – *Toronto*
- Walton Street Plant – *Toronto*

Ontario Power Generation – *Toronto*
Qulliq Energy Corporation – *Iqaluit*

FERTILIZER

Agrium Inc. – *Redwater*
Canadian Fertilizers Limited – *Medicine Hat*
Fafard et Frères ltée – *Saint-Bonaventure*
Mosaic Potash Belle Plaine – *Belle Plaine*
Mosaic Potash Colonsay – *Colonsay*
Mosaic Potash Esterhazy – *Esterhazy*
Profid'Or Coopérative Agricole – *Joliette*
Sherritt International Corporation – *Fort Saskatchewan*
Tourbières Berger ltée (Les) – *Baie-du-Vin, Baie Sainte-Anne, Saint-Modeste*

FOOD and BEVERAGE

A. Harvey & Company Limited – *St. John's*
Argentia Freezers – *Dunville*
Browning Harvey Limited – *Corner Brook, Grand Falls-Windsor, St. John's*
Abattoir Saint-Germain inc. – *Saint-Germain-de-Grantham*
AgEnergy Co-operative Inc. – *Guelph*
Agri-Marché Inc. – *Saint-Isidore*
Alberta Processing Co. – *Calgary*
Alex Coulombe Ltée – *Québec*
Aliments Lucyporc – *Yamachiche*
Aliments Ouimet-Cordon Bleu inc. – *Anjou*
Aliments Ultima Foods inc. – *Granby*
Aliments ED Foods inc. – *Pointe-Claire*
Aliments Multibar inc. (Les) – *Montréal*
Aljane Greenhouses Ltd. – *Pitt Meadows*
Alkema Greenhouses Ltd. – *Grimsby*
Allen's Fisheries Limited – *Benoit's Cove*
Amco Farms Inc. – *Leamington*
Andrés Wines Ltd. – *Grimsby*
Andrew Hendriks and Sons Greenhouses – *Beamsville*
Freeman Herbs – *Beamsville*
Andrew's Greenhouses Inc. – *Ruthven*
Antigonish Abattoir Ltd. – *Antigonish*
Antonio Bajar Greenhouses Limited – *Newmarket*
Atrahan Transformation Inc. – *Yamachiche*
Balfour Greenhouses Ltd. – *Fenwick*
Bayview Greenhouses (Jordan Station) Inc. – *Brantford, Jordan Station*
Belgian Nursery Limited – *Breslau*
Beothic Fish Processors Limited – *Badgers Quay*
Bevo Farms Ltd. – *Milner*
Biscuits Leclerc inc. – *Saint-Augustin-de-Desmaures*
Black Velvet Distilling Company – *Lethbridge*
Boekestyn Greenhouses – *Jordan Station*
Bonduelle Canada Inc. – *Bedford, Sainte-Cécile-de-Granby, Saint-Césaire, Saint-Denis-sur-Richelieu, Sainte-Martine*
Bonduelle Ontario Inc. – *Ingersoll, Stratroy, Tecumseh*
Border Line Feeders Inc. – *Ceylon*

Boulangerie St.-Méthode inc.– *Adstock*

Boulart inc. – *Lachine*

Breakwater Fisheries Limited – *Cottlesville*

Bridgeview Greenhouses – *Niagara-on-the-Lake*

Brookdale Treeland Nurseries – *Niagara-on-the-Lake*

Brookside Cold Storage Ltd. – *Chilliwack*

Brookside Poultry Limited – *Bridgetown*

Browning Harvey Limited – *Corner Brook, Grand Falls, St. John's, Windsor*

Brunato Farms Limited – *Leamington*

Burnbrae Farms Limited – *Brockville, Calgary, Lyn, Mississauga, Pandora, Winnipeg*

- Island Egg – *Westholme*
- Maple Lyn Foods Ltd. – *Strathroy*
- Oeufs Bec–O inc. (Les) – *Upton*

C & M Seeds – *Palmerston*

Café Vittoria inc. – *Sherbrooke*

Campbell Company of Canada – *Toronto*

Canada Bread Company Ltd. – *Beauport, Calgary, Chicoutimi, Concord, Delta, Edmonton, Etobicoke, Grand Falls, Hamilton, Langley, Laval, Levis, London, Moncton, Mont-Laurier, Montréal, North Bay, Québec, Scarborough, Saint-Côme-Linière, St. John's, Toronto, Woodstock*

Canada Malting Co. Ltd. – *Montréal*

Canadian Organic Maple Co. Ltd.– *Bath*

Cantor Bakery – *Montréal*

Canyon Creek Soup Company Ltd. – *Edmonton*

Cargill Animal Nutrition – *Camrose, Lethbridge*

Cargill Foods – *High River, Toronto*

Cargill Limited – *Sarnia, Winnipeg*

Cargill Aghorizons – *Albright , Brandon, Canora, Dauphin, Edmonton, Elm Creek, Lethbridge, Melbourne, Nicklen Siding, North Battleford, Princeton, Rosetown, Rycroft, Shetland, Staples, Strathroy, Talbotville, Vegreville, Winnipeg, Yorkton*

Cargill Meats Canada – *London*

Cargill Meat Solutions – *Guelph*

Casa Italia Ltd. – *Brampton, Port Colborne*

Cavendish Farms – *New Annan*

Cedar Beach Acres Ltd. – *Kingsville*

Cedar Field Greenhouses Ltd. – *Freelton*

Cedarline Greenhouses – *Dresden*

Central Alberta Greenhouses Ltd. – *Blackfalds*

Cericola Farms Inc. – *Bradford*

Sure Fresh Foods Inc. – *Bradford*

Cermaq Canada Ltd. – *Campbell River*

Champion Feed Services Ltd. – *Barrhead*

Champion Petfoods Ltd. – *Morinville*

Charles A. Heckel Holdings Ltd. o/a Johnston Greenhouses & Garden Centre – *Peterborough*

Clearwater Seafoods Limited Partnership – *Bedford*

- Clearwater Lobsters Ltd. – *Arichat, Clark's Harbour*
- Continental Seafoods – *Shelburne*
- Grand Bank Seafoods – *Grand Bank*
- Highland Fisheries – *Glace Bay*
- Pierce Fisheries – *Lockeport*
- St. Anthony Seafoods Limited – Partnership – *St. Anthony*

Coca-Cola Refreshments Canada – *Calgary, Toronto*

Cold Springs Farm Limited – *Thamesford*

Colonial Florists Ltd. – *St. Catharines*

Commercial Alcohols Inc. – *Brampton, Toronto*

Compagnie Allan Candy (La) – *Granby*

Conestoga Meat Packers Ltd. – *Breslau*

Connors Bros. – *Blacks Harbour*

Constellation Brands – *Niagara Falls*

Continental Mushroom Corporation (1989) Ltd. – *Metcalfe*

Cornies Farms Limited – *Kingsville*

CosMic Plants Inc. – *Beamsville*

County Grower Greenhouse – *Medicine Hat*

Cristofari Farms Inc. – *Leamington*

Crowley Farms Norwood Ltd. – *Norwood*

Crust Craft Inc. – *Edmonton*

Dallaire Spécialités inc. – *Rouyn-Noranda*

Dare Foods Limited – *Toronto*

Dainty Foods – Division of MRRM (Canada) Inc. – *Windsor*

Dairytown Products Ltd. – *Sussex*

Debono Greenhouses Limited – *Waterford*

Del Sol Greenhouses Inc. – *Kingsville*

Devan Greenhouses Ltd. – *Abbotsford*

Diageo Canada Inc. – *Gimli*

Domric International Ltd. – *Ruthven*

Don Chapman Farms Ltd./Lakeview Vegetable Processing Inc. – *Queensville*

Dr. Oetker Canada Ltd. – *Mississauga*

Dykstra Greenhouses – *St. Catharines*

E.D. Smith and Sons LP – *Winoma*

East Side Acres – *Leamington*

Ed Sobkowich Greenhouses – *Grimsby*

Elmira Poultry Inc. – *Waterloo*

Enniskillen Pepper Co. Ltd. – *Petrolia*

Erieview Acres Inc. – *Kingsville, Leamington*

Exceldor Coopérative Avicole – *Saint-Anselme*

Fancy Pokket Corporation – *Moncton*

Fairfield Propagators – *Chilliwack*

Federated Co-operatives Limited – *Saskatoon*

Ferme Daichemin s.e.n.c. – *Saint-Damase, Saint-Pie*

Ferme La Rouquine inc. – *Chicoutimi*

Fermes Lufa inc. (Les) – *Montréal*

Fernlea Flowers Limited – *Delhi*

Ferrero Canada Ltd. – *Brantford*

Five Star Farms – *Ruthven*

Fleischmann's Yeast – *Calgary*

Flower Ranch (The) – *London, Strathroy*

Fresh Sprout International Ltd. – *Mississauga*

Freshwater Fisheries Society of BC – *Victoria*

- Clearwater Trout Hatchery – *Clearwater*
- Fraser Valley Trout Hatchery – *Abbotsford*
- Kootenay Trout Hatchery – *Fort Steele*
- Summerland Trout Hatchery – *Summerland*
- Vancouver Island Trout Hatchery – *Duncan*

Freybe Gourmet Foods Ltd. – *Langley*

Frisia Flora Greenhouses – *Beamsville*

Frito Lay Canada – *Ancaster, Cambridge, Lethbridge, Lévis, Mississauga, New Minas, Pointe-Claire, Taber*

Froese Vegetables Inc. – *Vienna*

Furlani's Food Corporation – *Mississauga*

G.E. Barbour Inc. – *Sussex*

Ganong Bros. Limited – *St. Stephen*

General Mills Canada Corporation – *Midland, Saint-Hubert, Winnipeg*

George Sant & Sons Greenhouses – *Kleinburg*

Good Taste Food Products Inc. – *Scarborough*

Green Mountain Gardens – *Stoney Creek*

Greenfield Gardens (Niagara) Inc. – *Fenwick*

Greenwood Mushroom Farm – *Ashburn, Greenwood*

Gregory Greenhouses Inc. – *St. Catharines*

Griffith Laboratories – *Toronto*

Gull Valley Greenhouses – *Blackfalds*

H.J. Heinz Company of Canada Ltd. – *Leamington*

Handi Foods Ltd. – *Weston*

Hanemaayer Greenhouses – *Vineland Station*

Hans Dairy Inc. – *Toronto*

Harster Greenhouses Inc. – *Dundas*

Heritage Frozen Foods Ltd. – *Edmonton*

Hillside Hothouse Ltd. – *Ruthven*

Hiram Walker & Sons Limited – *Windsor*

Homeland Grain Inc. – *Burgessville*

Houweling Nurseries Ltd. – *Delta*

HQ Fine Foods – *Edmonton*

HSF Foods Ltd. – *Centreville*

Hubberts Industries – *Brampton*

Ice River Springs Water Co. Inc. – *Feversham*

Icewater Seafoods Inc. – *Arnold's Cove*

Imperial Tobacco Canada Ltd. – *Montréal*

Ingredion Canada Inc. – *Cardinal, Etobicoke, London, Port Colborne*

Inovata Foods Corp. – *Edmonton*

Jadee Meat Products Ltd. – *Beamsville*

Jayden Floral – *Dunnville*

Jeffery's Greenhouses Plant II Limited – *Jordan Station*

Jeffery's Greenhouses Inc. – *St. Catharines*

Jem Farms – *Ruthven*

John Kouwenberg Floral Inc. o/a Foliera – *Beamsville*

Jolly Farmer Products Inc. – *Northampton*

JTI-Macdonald Corp. – *Montréal*

Kapital Produce Limited – *Leamington, Ruthven*

Katatheon Farms Inc. – *Langley*

Kejay Farms Inc. – *Chatham*

Kern Water Systems Inc. – *Sarnia*

Kraft Canada Inc. – *Vancouver, Ville Mont-Royal,*

Kuyvenhoven Greenhouses Inc. – *Brampton, Halton Hills*

La Coop Fédérée – *Montréal, Joliette, Saint-Romuald*

Comax Coopérative Agricole – *Saint-Hyacinthe*

Société Coopérative Agricole des Bois-Francs – *Victoriaville*

La Corporation d'aliments Ronzoni du Canada – *Montréal*

La Rocca Creative Cakes – *Thornhill*

Landmark Feeds Inc. – *Abbotsford, Brossard, Claresholm, Landmark, Medicine Hat, Otterburne, Rosenort, Strathmore, Winnipeg*

Laprise Farms Ltd. – *Pain Court*

Lassonde Beverages Canada – *Toronto*

Leahy Orchards Inc. – *Franklin, Saint-Antoine Abbé*

Leclerc Foods Ltd. – *Hawkesbury*

Legal Alfalfa Products Ltd. – *Legal*

Les Aliments Dare limitée – *Sainte-Martine*

Les Cuisines Gaspésiennes ltée – *Matane*

Les Distilleries Schenley inc. – *Salaberry-de-Valleyfield*

Les Jardiniers du chef – *Blainville*

Les Oeufs d'Or – *Val d'Or*

Les Productions Horticoles Demers inc. – *Saint-Nicolas*

Les produits Zinda Canada inc. – *Candiac*

Les Serres Bergeron – *Notre-Dame-de-la-Salette, Notre-Dame-du-Laus*

Les Serres Daniel Lemieux inc. – *Saint-Rémi*

Les Serres Florinove – *Saint-Paulin*

Les serres Gilles et Francine Lahaie enr. – *Saint-Michel-de-Napierville*

Les Serres Gola – *Mont Saint-Grégoire*

Les Serres Lefort inc. – *Sainte-Clotilde*

Les Serres Maedler (1989) inc. – *Nyon*

Les Serres R. Bergeron inc. – *Saint-Apollinaire*

Les Serres Riel inc. – *Saint-Rémi*

Les Serres Sagami (2000) inc. – *Chicoutimi, Sainte-Sophie*

Les Serres Nouvelles Cultures inc. – *Sainte-Sophie*

Les Serres Serge Dupuis – *Saint-Élie-de-Caxton*

Les Serres Saint-Benoît-du-Lac inc. – *Austin*

Les Viandes du Breton inc. – *Rivière-du-Loup*

Lilydale Cooperative Ltd. – *Edmonton*

Lindy's Flowers – *Dunnville*

Link Greenhouses – *Bowmanville*

Linwell Gardens Ltd. – *Beamsville*

Lucerne Foods – *Calgary*

Lyalta Gardens – *Lyalta*

Lyo-San inc. – *Lachute*

Madelimer inc. – *Grande-Entrée*

Maidstone Bakeries Co. – *Brantford*

Maison des Futailles – *Saint-Hyacinthe*

Malteurop Canada Ltd. – *Winnipeg*

Maple Leaf Consumer Foods Inc. – *Hamilton, Laval, Lethbridge, Mississauga, North Battleford, Weston, Winnipeg*

Maple Leaf Foods Inc. – *Kitchener*

Maple Leaf Fresh Foods – *Brandon, Burlington, Charlottetown, Lethbridge, Stoney Creek, New Hamburg, Toronto, Wataskiwin*

Maple Lodge Farms Ltd. – *Norval*

Marcel Depratto inc. – *Saint-Louis-de-Richelieu*

Marish Greenhouses – *Dunnville*

Mars Canada Inc. – *Bolton, Newmarket*

Marsan Foods Limited – *Toronto*

Mastron Enterprises Ltd. – *Kingsville*

Mastronardi Estate Winery – *Grand Falls, Kingsville*

McCain Foods (Canada) – *Borden-Carleton, Carberry, Florenceville, Grand Falls, Mississauga, Portage la Prairie, Toronto*

- Charcuterie la Tour Eiffel – Division of McCain Foods Limited – *Blainville, Québec*
- Wong Wing – Division of McCain Foods Limited – *Montréal*

Meyers Fruit Farms and Greenhouses – *Niagara-on-the-Lake*

Minor Bros. Farm Supply Ltd. – *Dunnville*

Mitchell's Gourmet Foods Inc. – *Saskatoon*

Mondelez Canada Inc. – *Chambly, Hamilton*

- Biscuiterie Montréal – *Montréal*
- Cadbury Plant – *Toronto*
- Lakeshore Bakery – *Toronto*
- Peek Frean Bakery – *East York*

Montréal Pita inc. – *Montréal*

Mother Parkers Tea & Coffee Inc. – *Ajax, Mississauga*

Mt. Lehman Greenhouses (1999) Ltd. – *Mt. Lehman*

Mucci Farms Ltd. – *Kingsville*

Nadeau Poultry Farm Ltd. – *Saint-François-de-Madawaska*

Nanticoke Greenhouses Limited – *Simcoe*

Nature Fresh Farms – *Leamington*

Nature's Finest Produce Ltd. – *Pain Court*

Nestlé Canada Inc. – *Chesterville, Edmonton, North York, Rexdale, Scarborough, Sherbrooke, Toronto, Trenton*

Nestlé Professional – *Trenton*

Nestlé Purina PetCare – *Mississauga*

Nestlé Waters Canada – *Guelph*

New West Milling – *Bassano*

Nicol Florist Ltd. – *Brantford*

Noël Wilson & Fils S.N.C. – *Saint-Rémi*

Norfolk Fruit Growers' Association (The) – *Simcoe*

Norfolk Greenhouses Inc. – *Courtland*

Northern Alberta Processing Co. – *Edmonton*

Northumberland Co-operative Limited – *Miramichi*

Nunavut Development Corporation – *Rankin Inlet*

- Kitikmeot Foods Ltd. – *Cambridge Bay*
- Kivalliq Arctic Foods Ltd. – *Rankin Inlet*
- Pangnirtung Fisheries Ltd. – *Pangnirtung*

Oakrun Farm Bakery Ltd. – *Ancaster*

Ocean Nutrition Canada Ltd. – *Dartmouth*

Okanagan North Growers Cooperative – *Winfield*

Old Dutch Foods Inc. – *Summerside, Winnipeg*

Olymel S.E.C. / LP – *Red Deer*

- Aliments Prince S.E.C – *Princeville, Cornwall*
- Machinerie Olymel (1998) inc. – *Saint-Valérien-de-Milton*
- Olymel S.E.C. – *Anjou, Berthierville, Brampton, Iberville, Saint-Damase, Saint-Hyacinthe, Saint-Jean-sur-Richelieu, Trois-Rivières,*

Orangeline Farms Limited – *Leamington*

Orchard Park Growers Ltd. – *St. Catharines*

Origin Organic Farms Inc. - *Delta*

Otter Valley Foods Inc. – *Tillsonburg*

Oxford Frozen Foods Limited – *Oxford*

- Hillaton Foods – *Port Williams*

P. Ravensbergen & Sons. Ltd. – *Smithville*

Palmerston Grain – *Palmerston*

Paradise Hill Farms Inc. – *Nanton*

Paradise Island Foods Inc. – *Nanaimo*

Parrish & Heimbecker Limited – *Glencoe*

Parkway Gardens Ltd. – *London*

Pelee Hydroponics – *Leamington*

Pepe's Mexican Foods Inc. – *Etobicoke*

Peppertree Greenhouses Ltd. – *Tupperville*

Pepsi-Cola Canada Beverages – *Mississauga*

PepsiCo Foods Canada Inc. – *Peterborough, Trenton*

Petite Bretonne inc. (La) – *Blainville*

Planet Bean Coffee Inc. – *Guelph*

Poinsettia Plantation (The) – *Bothwell*

Prairie Mushrooms (1992) Ltd. – *Sherwood Park*

Prism Farms Ltd. – *Leamington*

Production Serres Yargeau inc. – *Sherbrooke*

Produits Alimentaires Viau inc. (Les) – *Montréal-Nord*

Pyramid Farms Ltd. – *Leamington*

Quark Farms Ltd. – *Mossbank*

Redpath Sugar Ltd. – *Toronto*

Regal Greenhouses Inc. – *Virgil*

Reif Estate Winery Inc. – *Niagara-on-the-Lake*

Reinhart Foods Limited – *Stayner*

Rekker Gardens Ltd. – *Bowmanville*

Rich Products of Canada Limited – *Fort Erie*

Rol-land Farms Limited – *Campbellville*

Rootham's Gourmet Preserves Ltd. – *Guelph*

Rosa Flora Limited – *Dunnville*

Rothmans, Benson & Hedges Inc. – *North York*

Rothsay – *Dundas, Moorefield, Québec, Saint-Boniface, Truro*

- Rothsay, A member of Maple Leaf Foods Inc. – *Winnipeg*

Round Hill Poultry Limited – *Roundhill*

Sakai Spice (Canada) Corporation – *Lethbridge*

Les Salaisons Desco inc. – *Boisbriand*

Sanimax ACI inc. – *Lévis*

Sanimax Lom inc. – *Montréal*

Scotia Garden Seafood Inc. – *Yarmouth*

Scotian Halibut Limited – *Clarks Harbour, Lower Woods Harbour*

Schenck Farms & Greenhouses Co. Limited – *St. Catharines*

Schneider Foods – *Port Perry, St. Marys, Toronto*

Schuurman Greenhouses Ltd. – *Branchton*

Scotsburn Co-Operatives Services Ltd. – *Truro*

Scott Street Greenhouses Ltd. – *St. Davids*

Select Food Products Limited – *Toronto*

Sepp's Gourmet Foods Ltd. – *Delta, Richmond Hill*

Serres du Marais, inc. (Les) – *Sainte-Martine*

Serres Sylvain Cléroux (Québec) inc. (Les) – *Laval*

Shah Trading Company Limited – *Port Williams, Saint-Félix-de-Valois, Saint-Hugues, Saint-Hyacinthe, St. Marys, Saint Romuald, Scarborough, Stevensville, Summerside, Sussex, Truro, Weston, Yamachiche*

Sifto Canada Corporation – Goderich Evaporator Plant – *Goderich*

Simplot Canada (II) Limited – *Portage La Prairie*

Skjodt-Barrett Foods Inc. – *Brampton*
Sofina Foods Inc. – *London*
Sons Bakery – *Brampton, Calgary*
Southshore Greenhouses Inc. – *Kingsville*
Sovereign Farms – *Waterford*
Smucker Food of Canada Co. – *Sherbrooke*
Spring Valley Gardens Niagara Inc. – *St. Catharines*
St. David's Hydroponics Ltd. – *Beamsville, Niagara-on-the-Lake,*
Stag's Hollow Winery and Vineyard Ltd. – *Okanagan Falls*
Stratus Vineyards Limited – *Niagara-on-the-Lake*
Streef Produce Ltd. – *Princeton*
Sucre Lantic Limitée – *Montréal*
Sun Harvest Greenhouses – *Glenburnie*
Suns Bakery – *Brampton*
Sunshine Express Garden Centre Ltd. – *Niagara-on-the-Lake*
Sunny Crunch Foods Ltd. – *Markham*
Sunrise Bakery Ltd. – *Edmonton*
Sunrise Farms Limited – *Kingsville, Leamington*
Sunrise Greenhouses Ltd. – *Vineland Station*
Sunrite Greenhouses Ltd. – *Kingsville, Wheatley*
Sun-Rype Products Ltd. – *Kelowna*
SunSelect Produce (Delta) Inc. – *Aldergrove, Delta*
Suntech Greenhouses Ltd. – *Manotick*
Sunterra Meats Ltd. – *Trochu*
Sunwold Farms Ltd. – *Acme*
Largie Farm – *Dutton*
Peterborough Farms – *Indian River*
Sysco Canada, Inc. – *Acheson, Calgary, Etobicoke, Kelowna, Kingston, Lakeside, Langford, Milton, Mississauga, Moncton, Montréal, Mount Pearl, Peterborough, Port Coquitlam, Regina, Thunder Bay, Toronto, Vancouver, Winnipeg*
Target Marine Products Ltd. – *Sechelt*
Thomson Meats Ltd. – *Melfort*
Tidal Organics Inc. – *Pubnico*
Transfeeder Inc. – *Olds*
Trevisanutto's Greenhouses – *Thunder Bay*
Trophy Foods Inc. – *Calgary*
Unidindon inc. – *Saint-Jean-Baptiste*
Unifeed & Premix – *Lethbridge*
Unilever Canada – *Brampton, Rexdale*
United Floral Greenhouse – *Fenwick*
Valleyview Gardens – *Markham, Scarborough*
Van Geest Bros. Limited – *Grimsby, St. Catharines*
Van Houtte S.E.C. – *Montréal*
Van Noort Florists – *Niagara-on-the-Lake*
Vandermeer Greenhouses Ltd. – *Niagara-on-the-Lake*
Vandermeer Nursery Ltd. – *Ajax*
Van Vliet Greenhouses Inc. – *Fenwick*
VanZanten Greenhouses – *Fenwick*
Veri Hydroponics Inc. – *Exeter*
Vermeer's Greenhouses – *Welland*
Versacold Corporation – *Vancouver*
Vincor International Inc. – *Niagara Falls*
Virgil Greenhouses Ltd. – *Niagara-on-the-Lake*
Viterra Inc. o/a SWP – Thunder Bay Terminal Elevator Viterra "A" – Viterra "B" – *Thunder Bay*
Viterra Food Processing – *Barrhead*
Vitoeuf inc. – *Saint-Hyacinthe*
Voogt Greenhouses Inc. – *Niagara-on-the-Lake*
Voortman Cookies Ltd. – *Burlington*
Young Street Gardens Ltd. – *Smithville*
W.J. O'Neil & Sons Ltd. – *Maidstone*
W.T. Lynch Foods Limited – *Toronto*
W. Martens Greenhouses Inc. – *Leamington*
Waldan Gardens – *Wainfleet*
Waterloo Flowers Limited – *Breslau*
Weesjes Greenhouses Ltd. – *St. Thomas*
Westland Greenhouses (Jordan) Ltd. – *Jordan Station*
Weston Foods Inc. – *Etobicoke*
Weston Bakeries Limited – *Kingston, Kitchener, Orilia, Ottawa, Sudbury, Toronto, Winnipeg*
Bronson Bakery Limited – *Ottawa*
Crissa Bakery – *Barrie*
Golden Mill Bakery – *Hamilton*
Maplehurst Bakeries Inc. – *Brampton*
Pepe's Mexican Foods Inc. – *Etobicoke*
Ready Bake Foods Inc. – *Mississauga*
Weston Fruit Cake Co. – *Cobourg*
Willow Spring Hydroponics Farms Ltd. – *Bothwell*
Willy Haeck et Fils Inc. – *Saint-Rémi*
Willy's Greenhouses Ltd. – *Niagara-on-the-Lake*
Windset Greenhouses Ltd. – *Delta*
Witzke's Greenhouses Ltd. – *Courtice*
Woodhill Greenhouses Inc. – *Lynden*

FOREST PRODUCTS

AbitibiBowater Inc. – o/a Resolute Forest Products – *Alma, Amos, Baie-Comeau, Brooklyn, Bridgewater, Clermont, Fort Frances, Girardville, Grand Falls – Windsor, Grand-Mère, Iroquois Falls, Jonquière, La Doré, Maniwaki, Mistassini, Montréal, Price, Saint-Félicien, Saint-Raymond, Thorold*
Abzac Canada Inc. – *Drummondville, Trois-Rivières*
Alberta Newsprint Company – *Whitecourt*
Alberta-Pacific Forest Industries Inc. – *Boyle*
Atlantic Packaging Products Ltd. – *Agincourt, Brampton, Don Mills, Ingersoll, Mississauga, Scarborough*
AV Cell Inc. – *Atholville*
AV Nackawic Inc. – *Nackawick*
Barco Materials Handling Limited – *Burns Lake*
Baytree Logging Ltd. – *Baytree*
Bois-Francs inc. – *Saint-Phillippe-de-Néri*
Building Products of Canada Corp. – *Edmonton, Pont Rouge*
Cariboo Pulp and Paper Company Limited – *Quesnel*
Caraustar Industrial & Consumer Products Group – *Kingston*
Canfor Corporation – *Vancouver*
Canadian Forest Products – *Bear Lake*
Canfor Pulp Limited Partnership – *Prince George*
Intercontinental – *Prince George*

Northwood – *Prince George*

Prince George – *Prince George*

Cascades Boxboard Group – *Jonquière, Mississauga, Montréal, Toronto*

Cascades Conversion Inc. – *Kingsey Falls*

Cascades Enviropac – *Berthierville, Saint-Césaire*

Cascades Fine Paper Group – *Breakeyville, Saint-Jérôme*

Converting Center – *Saint-Jérôme*

Cascades Inc. – *Kingsey Falls*

Cascades Lupel – *Cap-de-la-Madeleine*

Cascades Multi-Pro – *Drummondville*

Cascades Speciality Products Group – *Kingsey Falls*

Cascades Tissue Group – *Agincourt, Candiac, Kingsey Falls, Lachute*

Catalyst paper Corporation – Crofton Division – *Crofton*

Cie Matériaux de Construction BP Canada – *Joliette, Pont-Rouge*

CDEX usine de sciage – *Val d'Or*

Cherry Forest Products – Division of Barco Handling – *Pushlinch*

Coldstream Lumber – *Vernon*

Columbia Forest Products – *Saint-Casimir*

Commonwealth Plywood Co. Ltd. – *Lachute, Low, Mont-Laurier, Princeville, Rapides-des-Joachims, Sainte-Thérèse, Shawinigan*

Corporation Internationale Masonite Inc. (La) – *Lac Mégantic*

Dava Inc. – *Tring Junction*

Daishowa-Marubeni International Ltd. – *Peace River*

Domtar Inc. – *Dryden, Espanola, Kamloops, Montréal, Terrebonne, Windsor*

Easy Pack Corporation – *Markham*

Emballages Festival Inc. – *Montréal*

Emballages Mitchel-Linlcoln Ltée – *Drummondville, St-Laurent*

Emterra Environmental – *North Vancouver, Surrey*

Entreprises Interco inc. – *Saint-Germain-de-Grantham*

Erie Flooring and Wood Products – *West Lorne*

F.F. Soucy Inc. – *Rivière-du-Loup*

Finewood Flooring & Lumber Limited – *Baddeck*

Fiready Inc. – *Clair*

Flakeboard Company Limited – *St. Stephen*

Fortress Cellulose Spécialisée – *Thurso*

George Guenzler & Sons Inc. – *Kitchener*

Georgia-Pacific Canada, Inc. – *Thorold*

Granules L.G. inc. – *Saint-Félicien*

Greif Bros. Canada Inc – *LaSalle, Maple Grove*

Groupe Lebel (2004) inc. – *Cacouna, Rivière-du-Loup*

Bois Traitel ltée – *Saint-Joseph de Kamouraska*

Groupe Savoie inc. – *Saint-Quentin*

Harring Doors Ltd. – *London*

Industries Maibec inc. – *Saint-Pamphile*

Industries Ling Inc. – *Warwick*

Hinton Pulp – *Hinton*

Interlake Papers – *St. Catharines*

Irving Forest Services Limited – *Saint John*

Irving Papers Inc. – *Saint John*

Irving Tissue Corporation – *Dieppe*

Irving Tissue Inc. – *Dieppe*

J.D. Irving, Limited – *Saint John, Deersdale*

J.H. Huscroft Limited – *Creston*

K&C Silviculture Ltd. – *Red Deer, Oliver*

Kord Products Inc. – *Brampton*

Kruger Inc. – *Montréal*

Corner Brooke Pulp and Paper Limited – *Corner Brook*

Division Bromptonville – *Sherbrooke*

Division carton – *Montréal*

Division de papiers journal – *Sherbrooke*

Division des emballages – *Brampton, Lasalle*

Gérard Crête & Fils inc. – *Saint-Rock-de-Makina, Saint-Sévérin-de-Prouxville*

Kruger Products Ltd. – *Calgary, Gatineau*

Kruger Wayagamack Inc. – *Île-de-la-Potherie*

Longlac Wood Industries Inc. – *Mississauga*

Longue-Rive Planing and Drying Mills – *Longue-Rive*

Manufacturing Region East – *Crabtree, Sherbrooke*

Manufacturing Region West – *New Westminster*

Produits Kruger Limitée – *Lennoxville*

Scierie Manic, division de Kruger inc. – *Ragueneau*

Scierie Parent inc. , division de Kruger inc. – *Parent*

Lake Utopia Paper – *Utopia*

Les Cartons Northrich Inc. – *Granby*

Loger Toys Ltd. – *Brantford*

Louisiana-Pacific Canada Ltd. – *Bois-Franc, Dawson Creek, East River, Golden, Swan River*

Madawaska Doors Inc. – *Bolton*

Marcel Lauzon inc. – *East Hereford*

Maritime Paper Products Limited – *Dartmouth*

Marwood Ltd. – *Tracyville*

Master Packaging Inc. – *Borden-Carleton, Dieppe*

Matt'rs Inc. – *Wallaceburg*

MDF La Baie inc. – *La Baie*

Millar Western Forest Products Ltd. – Whitecourt Pulp Division – *Whitecourt*

Muskoka Timber Mills Limited – *Bracebridge*

Neucel Specialty Cellulose – *Port Alice*

Norampac Inc. – *Burnaby, Cabano, Calgary, Drummondville, Moncton, Saint-Bruno, St. Marys, Vaughan*

Norampac Lithotech – *Scarborough*

Norampac Inc. OCD – *Mississauga*

Norampac Inc. Viau – *Montréal*

Norampac – Newfoundland, a division of Cascades Canada Inc. – *St. John's*

Norbord Inc. – *Plaster Rock*

Northern Pulp Nova Scotia Corporation – *Abercrombie*

Orchard International Inc. – *Mississauga*

Palliser Lumber Sales Ltd. – *Crossfield*

Papiers Kingsey Falls, une division de Cascades Canada Inc. – *Kingsey Falls*

Paper Source Converting Mill Corp. – *Granby*

Papiers White Birch, division Stadacona SEC – *Québec*

Perfecta Plywood ltée – *Saint-Hyacinthe*

Planchers Mercier inc. – *Montmagny*

Peterboro Cardboards Limited – *Peterborough*

Pope & Talbot Ltd. – *Nanaimo*

Poutres et Poteaux Val-Morin inc. – *Sainte-Agathe-des-Monts*

Princeton Co-Generation Corporation – *Princeton*

Produits Kruger Limitée – *Crabtree, Gatineau, Lennoxville*

Rip-O-Bec inc. – *Saint-Apollinaire*

Riverside Forest Products Limited – *Armstrong*

Roland Boulanger & Cie ltée. – *Warwick*

Rosmar Litho Inc. – *Baie D'Urfé*

Sac Drummond Inc. – *Saint-Germain-de-Grantham*

Scierie Girard inc. – *Shipshaw*

Sonoco Canada Corporation – *Trois-Rivières*

Spécialiste du Bardeau de Cèdre inc. (Le) – *Saint-Prosper*

Tembec Inc. – *Témiscaming*

Tembec Industries Inc. – *Chapleau*

Tembec Paper Group – *Spruce Falls*

Terrace Bay Pulp – *Terrace Bay*

Tolko Industries Ltd. – *Armstrong, Heffley Creek, High Level, High Prairie, Kamloops, Kelowna, Lumby, Meadow, Lake Merritt, Quesnel, Slave Lake, The Pas, Vernon, Williams Lake*

Twin River Paper Company Inc. – *Edmunston*

West Fraser Timber Co. Ltd. – *Vancouver*

- Alberta Plywood Ltd. – *Slave Lake*
- Blue Ridge Lumber – *Whitecourt*
- Chetwynd Forest Industries – *Chetwynd*
- Eurocan Pulp and Paper Co. – *Kitimat*
- Fraser Lake Sawmills – *Fraser Lake*
- Hinton Pulp – *Hinton*
- Hinton Wood Products – *Hinton*
- Houston Forest Products – *Houston*
- 100 Mile Lumber – *100 Mile House*
- Northstar Lumber – *Quesnel*
- Pacific Inland Resources – *Smithers*
- Quesnel Plywood – *Quesnel*
- Quesnel River Pulp Co. – *Quesnel*
- Quesnel Sawmill – *Quesnel*
- Ranger Board – *Whitecourt*
- Slave Lake Pulp Corporation – *Slave Lake*
- Sundre Forest Products Inc. – *Sundre*
- West Fraser LVL – *Rocky Mountain House*
- West Fraser Mills – Chasm Division – *70 Mile House*
- West Fraser Mills Ltd. – *Quesnel*
- West Fraser Timber – *Williams Lake*
- WestPine MDF – *Quesnel*
- Williams Lake Plywood – *Williams Lake*

Zellstoff Celgar Limited Partnership – *Castlegar*

FOUNDRY

Ancast Industries Ltd. – *Winnipeg*

Bibby-Ste-Croix, Division Tuyauterie Canada Limitée – *Sainte-Croix*

Canadian Specialty Castings – *Niagara Falls*

Century Pacific Foundry Ltd. – *Surrey*

Deloro Stellite Inc. – *Belleville*

Elkem Métal Canada inc. – *Chicoutimi*

ESCO Limited – *Port Coquitlam, Port Hope*

Fonderie Générale du Canada, une compagnie Glencore – *Lachine*

Grenville Castings Limited – *Merrickville, Perth, Smiths Falls*

J & K Die Casting Ltd. – *Scarborough*

Johnson Matthey Limited – *Brampton*

M.A. Steel Foundry Ltd. – *Calgary*

Magotteaux ltée – *Magog*

Mueller Canada – *Saint-Jérôme*

Norcast Castings Company Ltd. – *Mont-Joli*

Peninsula Alloy Inc. – *Fort Erie, Stevensville*

Royal Canadian Mint – *Winnipeg*

Supreme Tooling Group – *Toronto*

Victaulic Custom Casting – *Richmond Hill*

Wabi Iron & Steel Corporation – *New Liskeard*

Wabtec Foundry – Div. of Wabtec Canada Inc. – *Wallaceburg*

GENERAL MANUFACTURING

3M Canada Company – *Brockville, Etobicoke, London, Morden, Perth*

A1 Label Inc. – *Toronto*

Aberfoyle Metal Treaters Ltd. – *Guelph*

Acadian Platers Company Limited – *Etobicoke*

Accuride Canada Inc. – *London*

Acier Les fab international inc. – *Terrebonne*

Active Burgess Mould & Design Ltd. – *Windsor*

Acuity Innovative Solutions – *Richmond Hill*

Advanced Ag and Industrial Ltd. – *Biggar*

AeroTek Manufacturing Limited – *Whitby*

AirBoss Produits d'Ingénierie inc. – *Acton Vale*

AirBoss Rubber Compounding – *Kitchener*

Airex Industries inc. – *Drummondville, Mississauga, Montréal*

Airia Brands Inc. – *London*

Airtek Systems Inc. – *Edmonton*

Airworks Compressors Corp. – *Edmonton*

Albany International Canada Inc. – *Perth*

Albarrie Canada Limited – *Barrie*

Alfield Industries, Division of Rea International Inc. – *Woodbridge*

Aluminum Surface Technologies – *Burlington*

Amec Usinage inc. – *Saint-Augustin-de-Desmaures*

American & Efird Canada Inc. – *Montréal*

Anchor Lamina Inc. – Reliance Fabrications – *Tilbury*

- Anchor Lamina Inc. – *Cambridge, Mississauga, Windsor*

Annabel Canada inc. – *Drummondville*

A.P. Plasman Inc. – *Tecumseh, Tilbury, Windsor*

A.R. Thomson Group – *Edmonton*

Armtec Limited Partnership – *Guelph, Woodstock*

Art Design International inc. – *Saint-Hubert*

Artopex Plus inc. – *Granby, Laval*

Arva Industries Inc. – *St. Thomas*

Associated Tube Industries – *Markham*

Atlantic Packaging Products Ltd. – *Scarborough*

Atlas Industries Ltd. – *Saskatoon*

Automatic Coating Limited – *Scarborough*
AYK Socks Inc. – *Saint-Léonard*
Babcock & Wilcox Canada Ltd. – *Cambridge*
Baron Metal Industries Inc. – *Woodbridge*
Barrday Inc. – *Cambridge*
BASF The Chemical Company – *Georgetown*
Batteries Power (Iberville) ltée – *Saint-Jean-sur-Richelieu*
Baxter Corporation – *Alliston*
B.C. Instruments – *Barrie, Schomberg*
Beaulieu Canada inc. – *Acton Vale*
Belvedere International Inc. – *Mississauga*
Bennett Fleet (Québec) inc. – *Ville-Vanier*
Bentofix Technologies Inc. – *Barrie*
Bernard Breton inc. – *Saint-Narcisse-de-Beaurivage*
Bérou International inc. – *Anjou*
Best Color Press Limited – *Vancouver*
Blount Canada Ltd. – *Guelph*
Borden Cold Storage Limited – *Kitchener*
Bosch Rexroth Canada Corp. – *Welland*
Bourgault Industries Ltd. – *St. Brieux*
Braam's Custom Cabinets – *St. Thomas*
Brampton Engineering Inc. – *Brampton*
Brant Corrosion Control Inc. – *Brantford*
Brawo Brassworking Ltd. – *Burk's Falls*
BRC Business Enterprises Ltd. – *Georgetown*
Brenntag Canada Inc. – *Mississauga*
Bridgeline Limited – *Deseronto*
Broan-NuTone Canada Inc. – *Mississauga*
Builders Furniture Ltd. – *Winnipeg*
Burnco Manufacturing Inc. – *Concord*
Butcher Engineering Enterprises Limited (The) – *Brampton*
Byers Bush Inc. – *Mississauga*
CAE Inc. – *Saint-Laurent*
Calko (Canada) Inc. – *Montréal, Ville d'Anjou*
Cambridge Towel Corporation (The) – *Cambridge*
Camfil Farr (Canada) Inc. – *Laval*
Cam-Slide – *Newmarket*
Canada Mold Technology – *Woodstock*
Cancoil Thermal Corporation – *Kingston*
Cambridge Brass Inc. – *Cambridge*
Cambridge Heat Treating Inc. – *Cambridge*
Canada's Best Store Fixtures Inc. – *Woodbridge*
Canada Colors and Chemicals Limited – Plastics Division – *Colborne*
Cana-Datum Moulds Ltd. – *Etobicoke*
Canadian Curtis Refrigeration Inc. – *Stoney Creek*
Canadian General-Tower Limited – *Cambridge*
Cannon Knitting Mills Limited – *Hamilton*
Canwood Furniture Inc. – *Penticton*
Cansew Inc. – *Montréal*
Carrière Bernier Limitée – *Saint-Jean-sur-Richelieu*
Carrière Union Ltée – *Québec*
Casavant Frères s.e.c. – *Saint-Hyacinthe*
Cascade Canada Ltd. – *Guelph*
Cello Products Inc. – *Cambridge*
Centerline (Windsor) Limited – *Windsor*
Centre du Comptoir Sag-Lac inc. – *Alma*
CertainTeed Gypsum Canada Inc – *Mississauga*
Chandelles Tradition ltée – *Laval*
Climatizer Insulation Inc. – *Etobicoke*
CMP Advanced Mechanical Solutions (Ottawa) Ltd. – *Ottawa*
CMP Solutions Mécaniques Avancées Ltée – *Châteauguay*
CNH Canada Ltd. – *Saskatoon*
Collingwood Fabrics Inc. – *Collingwood*
Colonial Tool Group Inc. – *Windsor*
Colorama Dyeing and Finishing Inc. – *Hawkesbury*
Colourific Coatings Ltd. – *Mississauga*
Columbia Industries Limited – *Sparwood*
Comp-Tech Mfg. Inc. – *North York*
Compact Mould Ltd. – *Woodbridge*
Compagnies du Groupe DATA (Les) – *Granby*
Compagnie Henry Canada inc. – *Lachine*
Conference Cup Ltd. – *London*
Consoltex Inc. – *Cowansville, Montréal*
Control Skateboards Inc. – *Saint-Nicolas*
Cooper-Standard Automotive – *Stratford*
Corporation Emballages Flexible Sonoco Canada – *Terrebonne*
Cosella-Dorken Products Inc. – *Beamsville*
Créations Verbois inc. – *Rivière-du-Loup*
Cristini North America Inc. – *Lachute*
Crown Metal Packaging Canada LP – *Calgary, Concord, Ville Saint-Laurent*
CUMI Canada Inc. – *Summerside*
D. Repol Enterprises Inc. – *Whitby*
Data Group of Companies (The) – *Brampton, Brockville, Drummondville*
Davis Wire Industries Ltd. – *Delta*
DCR Holdings Inc. – *Stoney Creek*
Délavage National inc. – *Asbestos*
Delta Elevator Co. Ltd. – *Kitchener*
Dentex – *Montréal*
Derma Sciences Canada Inc. – *Scarborough*
Descor Industries Inc. – *Markham*
DEW Engineering and Development Limited – *Miramichi, Ottawa*
Dipaolo CNC Retrofit Ltd. – *Mississauga*
Display Merchandising Group Inc. – *Scarborough*
Di-tech inc. – *Montréal*
Dixie Electric Ltd. – *Concord*
DK-Spec inc. – *Saint-Nicolas*
Dorothea Knitting Mills Limited – *Toronto*
Dortec Industries – *Newmarket*
Doubletex inc. – *Montréal*
Durable Release Coaters Limited – *Brampton*
Dura-Chrome Limited – *Wallaceburg*
Durham Furniture Inc. – *Durham*
Dutch Industries Ltd. – *Pilot Butte, Regina*
Eastern Fluid Power Inc. – *Kingston*
EHC Global – *Oshawa*
Emballages Alcan Lachine – *Lachine*
Emerson Process Management – *Edmonton*
Engauge Controls Inc. – *Lakeshore*

Enstel Manufacturing Inc. – *Concord*
Entreprises Dauphinais inc. (Les) – *Sherbrooke*
Envirogard Products Ltd. – *Richmond Hill*
Ezeflow Inc. – *Granby*
Fabrication S Houle inc. – *Saint-Germain-de-Grantham*
Farnel Packaging Limited – *Dartmouth*
Fasteners & Fittings Inc. – *Milton*
FBT Inc. – *St. Catharines*
Fileco Inc. – Division of Teknion Furniture Systems – *Concord*
Flexstar Packaging Inc. – *Richmond*
Floform Industries Ltd. – *Edmonton, Winnipeg*
Custom Countertops Ltd. – *Regina, Saskatoon*
Fournitures Funéraires Victoriaville inc. – *Victoriaville*
Fuller Industrial Corporation – *Lively*
Futuretek-Bathurst Tool Inc. – *Oakville*
Garaga Inc. – *Barrie*
Garant – *Saint-François*
Garland Commercial Ranges Limited – *Mississauga*
Garlock du Canada Ltée – *Sherbrooke*
Garrtech Inc – *Stoney Creek*
General Dynamics – Produits de défense et Systèmes tactiques Canada Inc. – *Saint-Augustin-de-Desmaures*
Genfoot Inc. – *Montréal*
George A. Wright & Sons Ltd. – *Kingston*
Georgia-Pacific Canada, Inc. – *Thorold*
Geo. Sheard Fabrics (1994) Ltd. – *Coaticook*
Global Casegoods Inc. – *Concord*
Global Wood Concepts Ltd. – *North York*
Gonderflex International inc. – *Longueuil*
Goodyear Canada Inc. – *Napanee*
Gosco Valves Inc. – *Oakville*
Gregory Signs & Engraving Ltd. – *Vaughan*
Groupe Altech 2003 inc. – *Pointe-Claire*
Groupe Lacasse inc. – *Saint-Pie*
Gunnar Manufacturing Inc. – *Calgary*
H. Beck Machinery Ltd. – *Windsor*
Hallink RSB Inc. – *Cambridge*
Hamilton Kent – *Toronto*
Harber Manufacturing Limited – *Fort Erie*
Hartmann Canada Inc. – *Brantford*
Hendrickson Spring – *Stratford*
Henninger's Diesel Limited – *Sudbury*
Heritage Memorials Limited – *Windsor*
Hercules SLR Inc. – *Dartmouth*
Hilroy, A Division of MeadWestvaCo Canada LP – *Toronto*
Hitachi Canadian Industries Ltd. – *Saskatoon*
Horst Welding Ltd. – *Listowel*
Hurteau & Associés inc. (Fruits & Passion) – *Candiac*
Hydroform Solutions – *Brampton*
Iafrate Machine Works Limited – *Thorold*
Infasco – *Marieville*
IKO Industries Ltd. – *Brampton, Hawkesbury*
IMAX Corporation – *Mississauga*
Imprimerie Interweb inc. – *Boucherville*
Indal Technologies Inc. – *Mississauga*
Independent Mirror Industries Inc. – *Toronto*
Industries Graphiques Cameo Crafts Limitée – *Montréal*
Integrated Mechanical Services Inc. – *Stratford*
Interface Flooring Systems (Canada) Inc. – *Belleville*
J.A. Wilson Display Ltd. – *Mississauga*
JAB Produits Récréatifs inc. – *Batiscan*
Jay Ge Electroplating Ltd. – *Laval*
Jervis B. Webb Company of Canada Ltd. – *Hamilton*
Jobal Industries Ltd. – *Brampton*
John Gavel Custom Manufacturing Ltd. – *Emo*
Johnsonite Canada Inc. – *Waterloo*
Jones Packaging Inc. – *London*
JTL Integrated Machine Ltd. – *Port Colborne*
Juliana Manufacturing Ltd. – *Winnipeg*
KelCoatings Limited – *London*
KI Pembroke LP – *Pembroke*
KIK Custom Products – *Etobicoke*
Franke Kindred Canada Limited – *Midland*
Kobay Tool & Stampings Inc. – *Scarborough*
Korex Canada – *Toronto*
Korex Don Valley ULC – *Toronto*
Kwality Labels Inc. – *Richmond Hill*
KWH Pipe (Canada) Ltd. – *Huntsville, Saskatoon*
Kuntz Electroplating Inc. – *Kitchener*
La Compagnie Américaine de Fer et Métaux inc. – *Montréal*
Lac-Mac Limited – *London*
Lainages Victor ltée – *Saint-Victor*
Lanart Rug inc. – *Saint-Jean-sur-Richelieu*
Lantz Truck Body Ltd. – *Port Williams*
Larsen & D'Amico Manufacturing Ltd. – *Edmonton*
Laser Impressions Inc. – *Saskatoon*
Laval Tool & Mould Ltd. – *Maidstone*
Lee Valley Tools Ltd. – *Carp, Ottawa*
Les Distributions Option Kit inc. – *Québec*
Les industries Peinteck inc. – *Chesterville*
Les Productions Ranger (1988) inc. – *Granby*
Les Produits Belt-Tech inc. – *Granby*
Les Technologies Fibrox ltée – *Thetford Mines*
Les Tricots Confort Absolu inc. – *Montréal*
Linamar Corporation – *Guelph*
Cemtol Mfg. – division of Linamar Corporation – *Guelph*
Skyjack Inc. – *Guelph*
Lincoln Electric Company of Canada LP – *Toronto*
Lincoln Fabrics Ltd. – *St. Catharines*
L'Oréal Canada inc. – *Ville Saint-Laurent*
Lowe-Martin Group (The) – *Mississauga, Ottawa,*
Ludlow Technical Products Canada, Ltd. – *Gananoque*
Luzenac Incorporated – *Timmins*
Maclean Engineering & Marketing Co. Limited – *Collingwood*
Magnum Signs Inc. – *Kent Bridge*
Maksteel Service Centre – *Mississauga*

Manluk Industries Inc. – *Wetaskiwin*

Manor Tool & Die Ltd.– *Oldcastle*

Mansour Mining Inc. – *Sudbury*

Manufacturier de bas de nylon Doris ltée – *Montréal*

Manufacturier TechCraft inc. – *Laval*

Marimac Group (The) – *Iroquois, Montréal*

Maritime Geothermal Ltd. – *Petitcodiac*

Matériaux Spécialisés Louiseville inc. – *Louiseville*

Maverick Canada Limited – *Wallaceburg*

McCabe Steel – a division of Russel Metals Inc. – *Stoney Creek*

McCloskey International Limited – *Peterborough*

MeadWestvaCo Packaging Systems LP – *Ajax, Pickering, Toronto*

Métal Leetwo Inc. – *Pointe-Claire*

Metal World Incorporated – *Torbay*

Métalus inc. – *Drummondville*

Metex Heat Treating Ltd. – *Brampton*

Metro Label Company Ltd. – *Toronto*

Metro Label Pacific Ltd. – *Langley*

Métro Jonergin Inc. – *Saint-Hubert*

Metroland Printing, Publishing & Distributing – *Mississauga*

Metso Minerals Canada Inc. – *North Bay*

Meubles Canadel inc. – *Louiseville*

Meubles Idéal ltée – *Saint-Charles-de-Bellechasse*

Michelin North America (Canada) Inc. – *New Glasgow*

MIRALIS inc. – *Saint-Anaclet-de-Lessard*

MLT International – *Saint-Pie*

Mobilier MEQ ltée – *La Durantaye*

Modern Dyers – *Hamilton*

Moli Industries Ltd. – *Calgary*

Momentum – *Newmarket*

Mondo America Inc. – *Laval*

Mondor ltée – *Saint-Jean-sur-Richelieu*

Montebello Packaging – *Hawkesbury*

Montréal Woollens (Canada) Ltd. – *Cambridge*

Moore Canada Corporation o/a RR Donnelley – *Cowansville, Edmonton, Fergus, Mississauga, Montréal, Oshawa, Scarborough, Trenton, Vancouver*

Morbern Inc. – *Cornwall*

MS Gregson div. de RAD Technologies Inc. – *Drummondville*

Multy Industries Inc. – *North York*

Nahanni Steel Products Inc. o/a Jancox Stampings – *Brampton*

National Rubber Technologies Corp. – a division of KN Rubber – *Toronto*

Newalta Corporation – *Abbotsford, Airdrie, Amelia, Brooks, Calgary, Cranbrook, Drayton Valley, Drumheller, Eckville, Edmonton, Elkpoint, Fort St. John, Gordondale, Grande Prairie, Halbrite, Hays, Hughenden, Nanaimo, Nisku, Nilton Junction, North Vancouver, Pigeon Lake, Prince George, Raymond, Red Earth, Redwater, Regina, Richmond, Sparwood, Stauffer, Stettler, Surrey, Taber, Valleyview, West Stoddart, Willesden Green, Winfield, Zama*

Nexans Canada Inc. – *Montréal–East*

NGF CANADA Limited – *Guelph*

NODMAN Automation Systems – *Rockwood*

Nord Gear Limited – *Brampton*

North American Decal – *Markham*

Northern Industrial Plating Ltd. – *Saskatoon*

Norwest Precision Limited – *Weston*

Novanni Stainless Inc. – *Coldwater*

Nutech Brands Inc. – *London*

Oberthur Jeux et Technologies inc. – *Montréal*

OCM Manufacturing – *Ottawa*

Oetiker Limited – *Alliston*

O-I Canada Corporation – *Montréal*

Olympic Tool & Die Inc. – *Mississauga*

Owens-Corning – *Toronto*

P. Baillargeon ltée – *Saint-Jean-sur-Richelieu*

Padinox Inc. – *Charlottetown, Winsloe*

Paisley Brick & Tile Co. Ltd. – *Paisley*

Pan-Oston Ltd. – *Peterborough*

Patt Technologies Inc. – *Saint-Eustache*

Pavage U.C.P. Inc. – *Charlesbourg*

Pavex ltée – *Jonquière*

Piddi Design Associates Limited – *Mississauga*

Pinnacle Finishing – *Chatham*

Pinnacle Mold Inc. – *Tecumseh*

Placage Chromex inc. – *Sainte-Foy*

Plastiques Cellulaires Polyform inc. – *Granby*

Polycor Granite Bussière inc. – *Saint-Sébastien*

Polycote Inc. – *Concord*

Polytainers Inc. – *Toronto*

Poudrier Frères ltée – *Victoriaville*

Poutrelles Delta inc. – *Sainte-Marie*

Powell PowerComm Inc. – *Edmonton, Grande Prairie, Hardisty, Lloydminster, Nisku, Olds, Provost*

Powercast Manufacturing inc. – *Saint-Eustache*

Premier Tech Horticulture ltée – *Rivière-du-Loup*

Prémoulé Comptoirs – *Saint-Augustin-de-Desmaures*

Prescott Finishing Inc. – *Prescott*

Prestige Glass International – *Elliot Lake*

PrintWest Communications Ltd. – *Regina, Saskatoon*

Pro-Meubles inc. – *Granby*

Procter & Gamble Inc. – *Belleville*

Produits D'Acier Hason inc. (Les) – *Berthierville, Lanoraie*

Produits Verriers Novatech inc. (Les) – *Sainte-Julie*

- Créations Vernova inc. (Les) – *Sainte-Julie*
- Groupe Verrier Novatech – *Sainte-Julie*
- Portes Novatech inc. – *Sainte-Julie*

ProFile Industries Ltd. – *North York*

Pullmatic Manufacturing – *Unionville*

QBD Cooling Systems Inc. – *Brampton*

Railtech Ltd. – *Baie d'Urfé*

Ramstar Carbide Tool Inc. – *Oldcastle*

Rayonese Textile inc. – *Saint-Jérôme*

Ready Rivet & Fastener Ltd. – *Kitchener*

Reko International Group Inc. – *Oldcastle*

- Concorde Machine Tool – *Tecumseh*
- Reko Automation & Machine Tool – *Tecumseh*
- Resco Canada Inc. – *Grenville-sur-la-Rouge*

Reversomatic Manufacturing Ltd. – *Woodbridge*

Ridgewood Industries Ltd. – *Cornwall*
RLD Industries Ltd. – *Ottawa*
Royal Building Technologies – *Woodbridge*
Royal Dynamics Co. – *Woodbridge*
Royal Machine Manufacturing Co. – *Woodbridge*
Royal Window Coverings (Canada) Inc. – *Boisbriand*
Royalbond Co. – *Woodbridge*
Roxul (West) Inc. – *Grand Forks*
Russel Metals Inc. – *Calgary, Mississauga*
McCabe Steel – a division of Russel Metals Inc. – *Stoney Creek*
Russell Industries – *St. Catharines*
- Canadian Babbitt Bearings Ltd. – *Brantford*
- CME Protective Coatings – *Sarnia*
- Gudgeon Thermfire International Inc. – *London*

S.A. Armstrong Limited – *Scarborough*
S.C. Johnson and Son, Limited – *Brantford*
Sable Marco inc. – *Pont-Rouge*
Sabre Machine Tool Inc. – *Oldcastle*
Safety-Kleen Canada Inc. – *Breslau*
Saint-Gobain Ceramic Materials Canada Inc. – *Niagara Falls, Paris*
Sandvik Materials Technology, Tube Production Unit, Division of Sandvik Canada Inc.– *Arnprior*
Sandvik Tamrock Canada Inc. – *Lively*
Sani Métal ltée – *Québec*
Sarjeant Company Ltd. (The) – *Barrie, Orillia*
Scapa Tapes North America Ltd. – *Renfrew*
Sher-Wood Hockey inc. – *Sherbrooke*
Shorewood Packaging Corp. – *Scarborough*
Siemens Milltronics Process Instruments Inc. – *Peterborough*
SIHI Pumps Limited – *Guelph*
Simmons Canada Inc. – *Brampton*
Sixpro inc. – *Notre-Dame-du-Bon-Conseil*
SMS Siemag Ltd. – *Oakville*
Société Industrielle de décolletage et d'outillage ltée – *Granby*
Société Laurentide Inc. – *Shawinigan*
SOFAME Technologies Inc. – *Montréal*
Sonaca NMF Canada – *Mirabel*
Soprema inc. – *Drummondville*
Soucy Techno inc. – *Rock Forest*
Soudure Germain Lessard inc. – *Boucherville*
Spartek Systems – *Sylvan Lake*
Spec Furniture Inc. – *Toronto*
Spinrite LP – *Listowel*
Sportspal Products – *North Bay*
Stanfield's Limited – *Truro*
Stedfast Inc. – *Granby*
Steelcase Canada Ltd. – *Markham*
Stepan Canada Inc. – *Longford Mills*
St. Lawrence Corporation – *Iroquois*
Suntech Heat Treating Ltd. – *Brampton*
Superior Radiant Products Ltd. – *Stoney Creek*
Supremex inc. – *Lasalle, Mississauga*
Techform Products Limited – *Penetanguishene*
Technologies Veyance Canada Inc. – *Saint-Alphonse de Granby*
Teknion Furniture Systems Ltd. – *Toronto*
Teknion Roy & Breton Inc. – *Saint-Romuald*
- RBLogistek – *Saint-Romuald*
- RBTek – *Saint-Romuald*
- Roy & Breton – *Saint-Vallier*
- Teknion Concept – *Lévis*
- Teknion Form – *Concord*
- Teknion Québec – *Montmagny*

Tekwood – a Division of Teknion Limited – *Toronto*
Télio & Cie – *Montréal*
TenCate Protective Fabrics Canada – *Magog*
Textiles Monterey (1996) inc. – *Drummondville*
Thermetco inc. – *Montréal*
Times Fiber Canada Limited – *Renfrew*
Top Grade Molds Ltd. – *Mississauga*
Tractel Limited – Swingstage Division – *Scarborough*
Tranches Polycor inc. – *Saint-Sébastien*
Transcontinental Interweb Toronto – *Mississauga*
- Imprimerie Interglobe inc. – *Beauceville*
- Imprimeries Transcontinental S.E.N.C. – *Boucherville, Saint-Hyacinthe*
- Transcontinental de la Capitale – *Québec*
- Transcontinental Printing 2005 G.P. – *Saskatoon*
- Transcontinental RBW Graphics – *Owen Sound*

Trenergy Inc. – *St. Catharines*
Tri-Service Metal Products Inc. – *Ajax*
Tube-Fab Ltd. – *Charlottetown, Mississauga*
Tuiles Polycor Inc. – *Saint-Sébastien*
Tylon Prototype – *Campbellville*
Ultramet Industries Inc. – *Breslau*
Uni-Fab – *Oldcastle*
Unifiller Systems Inc. – *Delta*
Unimotion-Gear – Division of Magna Powertrain Inc. – *Aurora*
Unique Tool & Gauge Inc. – *Windsor*
Unitrak Corporation Limited – *Port Hope*
USINATECH Inc. – *Melbourne*
USNR/Kockums Cancar Company – *Plessisville*
VA TECH Ferranti-Packard Transformers Ltd. – *Hamilton*
Van Wyck Packaging Ltd. – *Owen Sound*
Vannatter Group Inc. – *Wallaceburg*
Velcro Canada Inc. – *Brampton*
VeriForm Incorporated – *Cambridge*
Vesta Marble & Granite Ltd. – *Ottawa*
Vibac Canada inc. – *Montréal*
Vision Extrusion Group – *Woodbridge*
Vitafoam Products Canada Ltd. – *Downsview*
V.N. Custom Metal Inc. – *North York*
VicWest Steel – *Oakville*
VOA Canada Inc. – *Collingwood*
Vulcan Contenants (Québec) ltée – *Lachine*
Wabash Alloys Mississauga – *Mississauga*
Waiward Steel Fabricators Ltd. – *Edmonton*
Waterloo Textiles Limited – *Cambridge*
Waterville TG Inc. – *Waterville*
Watts Water Technologies (Canada) Inc. – *Burlington*

Walsh Brothers Welding – *Mitchell*
Web Offset Publications Limited – *Pickering*
Welland Forge – *Welland*
Welsh Industrial Manufacturing Inc. – *Stoney Creek*
Wescam Inc. – *Burlington*
Wheaton's Woodworking Ltd. – *Berwick*
Wheeltronic Ltd. – *Mississauga*
Windham Harvest Specialties Limited – *Simcoe*
Wolverine Tube (Canada) Inc. – *London*
Woodman Machine Products Ltd. – *Kingston*
YKK Canada Inc. – *Montréal*
Zip Signs Ltd. – *Burlington*
Zodiac Fabrics Company – *London*

LIME

Carmeuse Beachville (Canada) Limited – *Blind River*
Carmeuse Lime (Canada) Limited – *Dundas, Ingersoll*
Chemical Lime Company of Canada Inc. – *Langley*
Ebel Quarries Inc. – *Wiarton*
Graymont (NB) Inc. – *Havelock*
Graymont (QC) Inc. – *Bedford, Boucherville, Joliette, Marbleton*
Graymont Western Canada Inc. – *Cache Creek, Calgary, Richmond (C.O.)*
- Summit Plant – *Coleman*
- Exshaw Plant – *Exshaw*
- Faulkner Plant – *Faulkner*

MINING

Aerosion Ltd. – *Aldersyde*
ArcelorMittal Mines Canada – *Port-Cartier*
Barrick Gold – *Hemlo*
- Williams Operation – *Hemlo*

BHP Billiton Diamonds Inc. – *Yellowknife*
Canadian Salt Company Limited (The) – *Pugwash*
Construction DJL Inc. – *Boucherville, Bromont*
- Continental, division de Construction DJL inc. – *Boucherville, Shawinigan*

De Beers Canada Inc. – *Toronto, Yellowknife, Timmins*
Démix Agrégats – *Varennes*
Démix Agrégats, une division de Holcim (Canada) inc. – *Laval*
Glencore Canada Corporation – *Toronto*
- Brunswick Smelter – *Belledune*
- Mine Matagami – *Matagami*

Goldcorp Inc. – *Vancouver*
- Goldcorp Canada Ltd. – Musselwhite Mine – *Thunder Bay*
- Goldcorp Inc. – Porcupine Gold Mine Division – *South Porcupine*

Hillsborough Resources Limited – *Campbell River*
Hudson Bay Mining & Smelting Co. Ltd. – *Flin Flon*
Hy-Tech Drilling Ltd. – *Saskatoon*
Iron Ore Company of Canada – *Labrador City*
Les Mines Opinaca ltée – *Rouyn-Noranda*
Luzenac Inc. – *Timmins*
Mine Agnico Eagle Limitée, division LaRonde – *Rouyn-Noranda*
Mines Wabush – *Sept-Îles*
New Gold – New Afton Mine – *Kamloops*
Teck Metals Ltd. – *Trail*
Teck Resources Limited – *Vancouver*
Vale Inco – *Birchtree, Copper Cliff, Creighton, Garson, McCreedy East, Mississauga, Murray, Port Colborne, Stobie, Thompson, Toronto, Totten, Victor, Voisey's Bay*

OIL SANDS

Suncor Energy Inc. – Suncor Group – *Sarnia*
Syncrude Canada Ltd. (Oil Sands) – *Fort McMurray*

PETROLEUM PRODUCTS

Bitumar Inc. – *Hamilton, Montréal*
Chevron Canada Limited – *Burnaby, Vancouver*
Husky Energy Inc. – *Calgary*
Husky Oil Operations Ltd. – *Rainbow Lake*
Imperial Oil Limited – *Calgary*
Irving Oil Limited – *Saint John*
North Atlantic Refining Limited – *Come By Chance*
Nova Chemicals (Canada) Limited – *Calgary*
Shell Canada Limited – *Calgary*
Suncor Energy Products Partnership – *Calgary*
Ultramar Ltée – *Montréal*

PIPELINES

Duke Energy Gas Transmission – *Calgary, Chetwynd, Fort Nelson, Hope, Mile 117, Mile 126, Pink Mountain, Taylor, Vancouver*
Enbridge Pipelines Inc. – *Calgary, Edmonton*
Floating Pipeline Company (The) – *Halifax, Saint John*

PLASTICS

1 Source Design Ltd. – *Wallaceburg*
ABC Group Inc. – *Toronto*
- ABC Air Management Systems – *Rexdale, Ronson*
- ABC Plastic Moulding – *Brydon, Orlando*
- MSB Plastics Manufacturing Ltd. – *Etobicoke*
- PDI Plastics Inc. – *Etobicoke*
- Polybottle Group Limited – *Edmonton, Vancouver*
- Saflex Polymers Limited – *Weston*
- Salga Associates – *Concord*

ADS Groupe Composites Inc. – *Thetford Mines*
Advanced Panel Products Ltd. – *Nisku*
AMCOR PET Packaging – *Moncton*
American Biltrite (Canada) ltée – *Sherbrooke*

Amhil Enterprises – *Burlington, Mississauga*

Ani-Mat inc. – *Sherbrooke*

A.P. Plasman Inc. – *Windsor*

Armtec Limited Partnership – *Orangeville*

BainUltra inc. – *Saint-Nicolas*

Baytech Plastics Inc. – *Midland*

Berry Plastics Canada Inc. – *Waterloo*

Berry Plastics – *Belleville*

Blue Falls Manufacturing Ltd. – *Coleman, Thorsby*

Cam-Slide – *Newmarket*

Camoplast Inc. – *Richmond*

Camtac Manufacturing – division of Linamar Holdings Inc. – *Guelph*

Canplas Industries Ltd. – *Barrie*

Cascades Inopak – *Drummondville*

CKF Inc. – *Etobicoke, Langley, Rexdale*

Clorox Company of Canada Ltd. (The) – *Brampton, Orangeville*

Co-Ex-Tec – *Concord*

Compact Mould Ltd. – *Brampton*

D & V Plastics Inc. – *Acton*

DDM Plastics – *Tillsonburg*

Deflex Composite inc. – *Saint-Victor*

Downeast Plastics Ltd. – *Cap-Pelé*

Dura-Tech Industrial & Marine Limited – *Dartmouth*

DynaPlas Ltd. – *Scarborough*

Emballage Saint-Jean ltée – *Saint-Jean-sur-Richelieu*

Emballages Poliplastic Inc. – *Granby*

Entreprises Hamelin – Division de Groupe Hamelin Inc. – *Boucherville*

Fabrene Inc. – *North Bay*

Fenplast – *Delson*

Fibres Armtex inc. – *Magog*

Flexahopper Plastics Ltd. – *Lethbridge*

Formica Canada inc. – *Saint-Jean-sur-Richelieu*

FRP Systems Ltd. – *Thunder Bay*

Genpak Limited Partnership – *Mississauga*

Greif Bros. Canada Inc. – *Belleville*

Groupe Accent-Fairchild inc. – *Saint-Laurent*

Groupe RCM inc. – *Yamachiche*

GSW Building Products – *Barrie*

High-Q Design Ltd. – *Edmonton*

Hinspergers Poly Industries Ltd. – *Mississauga*

Horizon Plastics International Inc. – *Cobourg*

Husky Injection Molding Systems Ltd. – *Bolton*

Hymopack Ltd. – *Etobicoke*

Les industries de moulage Polytech inc. – *Granby*

Imaflex Inc. – *Montréal*

Industries Nigan (Les) – *Cookshire-Eaton*

Injection Technologies Inc. – *Windsor*

Intertape Polymer Group – *Truro*

IPEX Inc. – *Edmonton, Invader, Langley, L'Assomption, London, Mississauga, Saint-Jacques-de-Montcalm, Saint-Joseph-de-Beauce, Saint-Laurent, Scarborough*

Jacobs & Thompson Inc. – *Weston*

Jokey Plastics North America Inc. – *Goderich*

Kal-Trading Inc. – *Mississauga*

Kohler Canada Co. – *Armstrong*

L-D Tool & Die Inc. – Div. of Madix Engineering Inc. – *Stittsville*

Lefko Produits de Plastiques inc. – *Magog*

Les industries de moulage Polymax – *Granby*

Masternet Ltd. – *Mississauga*

Matrix Packaging Inc. – *Mississauga*

Mold-Masters Limited – *Georgetown*

Molded Plastic Consultants – *Shanty Bay*

Neocon International – *Dartmouth*

Newdon Industries Ltd. – *Fergus*

Newell Rubbermaid – *Calgary, Mississauga*

Niigon Techonologies Ltd. – *MacTier*

Norseman Plastics Limited – *Etobicoke*

Nu-Co Plastics – *Blenheim*

Ontario Plastic Container Producers Ltd. – *Brampton*

Pano Cap (Canada) Limited – *Kitchener*

Papp Plastics & Distributing Limited – *Windsor*

Par-Pak Ltd. – *Brampton*

Plastiflex Canada Inc. – *Orangeville*

Plastiques Cascades inc. – *Kingsey Falls*

Plastiques GPR inc. – *Saint-Félix-de-Valois*

Plastiques Novaprofil inc. – *Sainte-Julie*

Plastube inc. – *Granby*

PM Plastics Ltd. – *Windsor*

Polar Plastique ltée – *Montréal*

Pollard Windows Inc. – *Burlington*

Polybrite – *Richmond Hill*

Pultrall Inc. – *Thetford Mines*

Reid Canada Inc. – *Mississauga*

Reinforced Plastic Systems – *Mahone Bay, Minto*

Reliance Products LP – *Winnipeg*

Richards Packaging Inc. – *Etobicoke*

Rochling Engineering Plastics Ltd. – *Orangeville*

Ropak Packaging – *Langley, Oakville, Springhill*

Royal Group Technologies Limited – *Woodbridge*

- Candor Plastics Co. – *Woodbridge*
- Crown Plastics Extrusions Co. – *Woodbridge*
- Dominion Plastics Co. – *Woodbridge*
- Dynast Plastics Co. – *Winnipeg*
- Gracious Living Industries – *Woodbridge*
- Imperial Plastics Co. – *Woodbridge*
- Industrial Plastics – *Saint-Hubert*
- Le-Ron Plastics Inc. – *Surrey*
- Majestic Plastics Co. – *Woodbridge*
- Montréal PVC – *Saint-Laurent*
- Prince Plastics Co. – *Woodbridge*
- Regal Plastics Co. – *Woodbridge*
- Residential Building Products – *Saint-Lambert-de-Lauzon*
- Royal EcoProducts Co. – *Concord*
- Royal Flex-Lox Pipe Limited – *Abbotsford*
- Royal Foam Co. – *Woodbridge*
- Royal Group Resources Co. – *Woodbridge*
- Royal Outdoor Products Co. – *Woodbridge*
- Royal Pipe Co. – *Woodbridge*
- Royal Plastics Co. – *Concord*
- Royal Polymers Limited – *Sarnia*

- Royal Tooling Co. – *Woodbridge*
- Roytec Vinyl – *Woodbridge*
- Thermoplast – *Laval*
- Ultimate Plastics Co. – *Woodbridge*

S & Q Plastic – Division of Uniglobe (Canada) Inc. – *Mississauga*

SABIC Specialty Extrusion Canada – *Long Sault*

Silgan Plastics Canada Inc. – *Lachine, Mississauga*

Soniplastics Inc. – *Boucherville*

Sonoco Flexible Packaging Canada Corporation – *Mississauga*

Soucy Baron Inc. – *Saint-Jérôme*

Tarkett inc. – *Farnham*

Technologies d'extrusion appliquées (Canada) inc. – *Varennes*

Truefoam Limited – *Dartmouth*

Valley Acrylic Bath Ltd. – *Mission*

Vifan Canada inc. – *Lanorai-d'Autray, Montréal,*

Vulsay Industries Ltd. – *Brampton*

W. Ralston (Canada) Inc. – *Brampton*

Winpak Heat Seal Packaging Inc. – *Vaudreuil-Dorion*

Winpak Portion Packaging Ltd. – *Toronto*

Woodbridge Foam Corporation – *Woodbridge*

STEEL

Abraham Steel Service Ltd. – *Woodbridge*

AltaSteel Ltd. – *Edmonton*

ArcelorMittal Dofasco Inc. – *Hamilton*

ArcelorMittal Montréal inc. – *Contrecœur-Est, Contrecœur-Ouest, Hamilton East, Longueuil, Saint-Patrick-Montréal*

ArcelorMittal Tubular Products – *Woodstock*

Armtec Limited Partnership – *Guelph*

Brannon Steel – *Brampton*

Bull Moose Tube Limited – *Burlington*

Douglas Barwick Inc. – *Brockville*

Essar Steel Algoma Inc. – *Sault Ste. Marie*

Gerdau Ameristeel Corporation – *Cambridge*
- Gerdau Ameristeel Whitby – *Whitby*
- Gerdau Ameristeel Manitoba – *Selkirk*

Ivaco Rolling Mills 2004 LP – *L'Orignal*

Lakeside Steel Corp. – *Welland*

Laurel Steel – Division of Harris Steel – *Burlington*

Nelson Steel – Division of Samuelson & Co. Ltd. – *Stoney Creek*

Nova Tube inc. – *Montréal*

Ontario Chromium Plating Inc. – *Oakville*

Rio Tinto Fer et Titane inc. – *Tracy*

Spencer Steel Ltd. – *Ilderton*

Samuel Plates Sales – *Stoney Creek*

U.S. Steel Canada Inc.
- Hamilton Works – *Hamilton*
- Lake Erie Works – *Nanticoke*

TRANSPORTATION EQUIPMENT MANUFACTURING

A.G. Simpson Automotive Inc. – *Cambridge, Oshawa, Scarborough*

ABC Group Inc. – *Toronto*
- ABC Climate Control Systems Inc. – *Toronto*
- ABC Flexible Engineered Product Inc. – *Etobicoke*
- ABC Group Exterior Systems – *Toronto*
- ABC Group Interior Systems – *Toronto*
- ABC Group Product Development – *Toronto*

ABC Metal Products Inc. – *Toronto*
- LCF Manufacturing Ltd. – *Rexdale, Weston*

Aalbers Tool & Mold Inc. – *Oldcastle*

Anton Mfg. – *Concord*

Arcon Metal Processing Inc. – *Richmond Hill*

Avcorp Industries Inc. – *Delta*

Aviation Lemex inc. – *Saint-Hubert*

B & W Heat Treating Canada ULC – *Kitchener*

Bombardier Aerospace – *Downsview*

Bombardier Aéronautique – *Mirabel, Saint-Laurent*

Bombardier Produits Récréatifs Inc. – *Valcourt*

Bovern Enterprises Inc. – *Markham*

Cami Automotive Inc. – *Ingersoll*

Capital Tool & Design Ltd. – *Concord*

Chalmers Suspensions International Inc. – *Mississauga*

Chemin de fer Canadien Pacifique – *Montréal*

Citerne Almac International inc. – *Lanoraie*

Composite Atlantic Limited – *Lunenburg*

Corvex Mfg. – division of Linamar Corporation – *Guelph*

CSI Gear Corporation – *Mississauga*

Chrysler Canada LLP
- Brampton assembly plant – *Brampton*
- Cpk interior products plant – *Port Hope*
- Etobicoke casting plant – *Etobicoke*

Dana Canada Corporation – *Burlington, Cambridge, Oakville*

Dana Thermal Products – *Mount Forest*

Dortec Industries – Division of Magna International Inc. – *Newmarket*

Dresden Industrial – *Rodney, Stratford*

Dura-Lite Heat Transfer Products Ltd. – *Calgary*

DYNA-MIG Mfg. of Stratford Inc. – *Stratford*

Eston Manufacturing – division of Linamar Corporation – *Guelph*

Eurocopter Canada Limited – *Fort Erie*

F & P Mfg., Inc. – *Tottenham*

Faurecia Automotive Seating – *Bradford*

Ford Motor Company of Canada, Limited – *Oakville, St. Thomas, Windsor*

Formet Industries – *St. Thomas*

GATX Rail Canada – *Coteau-du-Lac, Moose Jaw, Montréal, Red Deer, Rivière-des-Prairies, Sarnia*

General Motors of Canada Limited – *Oshawa, St. Catharines*

Global Emissions Systems Inc. – *Whitby*

Glueckler Metal Inc. – *Barrie*

Groupe Environnemental Labrie – *Saint-Alphonse*

Halla Climate Control Canada Inc. – *Belleville*

Hastech Mfg. – *Guelph*

Héroux Devtek inc. – *Longueuil, Scarborough*

Hitachi Construction Truck Manufacturing Ltd. – *Guelph*

Honda of Canada Mfg. – *Alliston*

Kingsville Stamping Ltd. – *Kingsville*

Jefferson Elora Corporation (JEC) – *Elora*

Johnson Controls LP – *London, Milton, Mississauga, Tillsonburg*

Lafrate Machine Works Ltd. – *Thorold*

Lunenburg Industrial Foundry & Engineering Limited – *Lunenburg*

Leggett & Platt Inc. London – *London*

Schukra of North America – *Lakeshore*

Linex Manufacturing – division of Linamar Corporation Inc. – *Guelph*

Litens Automotive Partnership – *Woodbridge*

LPP Manufacturing – division of Linergy Manufacturing Inc. – *Guelph*

Mancor Canada Inc. – *Oakville*

Massiv Die-Form – *Brampton*

Métal Marquis inc. – *La Sarre*

Modatek Systems – *Milton*

National Steel Car Limited – *Hamilton*

Nemak of Canada – Windsor Aluminum Plant – *Windsor*

Neptunus Yachts – *St. Catharines*

Niagara Piston Inc. – *Beamsville*

Northstar Aerospace (Canada) Inc. – *Milton*

NTN Bearing Corporation of Canada – *Mississauga*

Omron Dualtec Automotive Electronics Inc. – *Oakville*

Ontario Drive & Gear Limited – *New Hamburg*

Orenda Aerospace Corporation – *Mississauga*

Orlick Industries Limited – *Hamilton*

Pilkington Glass of Canada Limited – *Collingwood*

Platinum Tool Technologies – *Oldcastle*

Pratt & Whitney Canada Corp. – *Enfield, Longueuil, Saint-Hubert*

Presstran Industries – *St. Thomas*

Prévost – division of Volvo Group Canada – *Sainte-Claire*

Prince Metal Products Ltd. – *Windsor*

Procor Limited – *Edmonton, Joffre, Oakville, Regina, Sarnia*

Quadrad Manufacturing – division of Linamar Corporation Inc. – *Guelph*

Remtec Inc. – *Chambly*

Roctel Manufacturing – division of Linamar Corporation Inc. – *Guelph*

Rollstamp Mfg., division of Decoma International Inc. – *Concord*

Satisfied Brake Products Inc. – *Cornwall*

Simcoe Parts Service Inc. – *Alliston*

Spinic Manufacturing – division of Linamar Corporation Inc. – *Guelph*

Stackpole International – *Ancarster, Mississauga*

StandardAero – *Winnipeg*

STT Technologies Inc. – *Concord*

Summo Steel Corp. – *Burlington*

Sydney Coal Railway Inc. – *Sydney*

Tool-Plas Systems Inc. – *Oldcastle*

Toyota Motor Manufacturing Canada Inc. – *Cambridge*

Traxle Mfg – division of Linamar Corporation Inc. – *Guelph*

TRW Automotive – *St. Catharines, Woodstock*

TS Tech Canada Inc. – *Newmarket*

Unison Engine Components – *Orillia*

Vehcom Manufacturing – division of Linamar Corporation Inc. – *Guelph*

Ventra Group Co. – *Calgary*

- Flex-n-Gate Bradford – *Bradford*
- Flex-n-Gate Canada – *Tecumseh*
- Flex-n-Gate Seeburn – *Beaverton, Tottenham*
- Veltri Metal Products – *Glencoe, Tecumseh, Windsor*
- Ventra AFR – *Ridgetown*
- Ventra Plastics Kitchener – *Kitchener*
- Ventra Plastics Windsor – *Windsor*

Volvo Cars of Canada Toronto – *Toronto*

Wallaceburg Preferred Partners – *Wallaceburg*

Woodbridge Foam Corporation – *Mississauga*

UPSTREAM OIL AND GAS

AltaGas Services Inc. – *Wabasca*

Baytex Energy Ltd. – *Taber*

BP Canada Energy Company – *Calgary, Edson, Grande Prairie, Rocky Mountain House*

Cenovus Energy Inc. – *Calgary*

Chevron Canada Resources – *Calgary*

Connacher Oil and Gas Ltd. – *Calgary*

ConocoPhillips Canada – *Atlantic French Corridor, Big Valley, Calgary, Deep Basin, Edson, Foothills, Jenner, Kaybob/Edson, Mackenzie Delta, Morrin, Northern Plains, Rimbey/O'biese, Southern Plains, Vulcan, Wembley*

Crescent Point Energy Trust – *Calgary, Sounding Lake*

Devon Canada Corporation – *Calgary, Central, Deep Basin, Fairview, Foothills, Fort McMurray, Fort St.-John, Lloydminster, NE British Columbia/NW Alberta, Northern Plains, Peace River*

Imperial Oil Limited – *Calgary*

Keyera Energy – *Rocky Mountain House*

Nexen Canada Ltd. – *Calgary*

Nuvista Energy Ltd. – *Calgary*

Paramount Resources Ltd. – *Calgary*

Pengrowth Corporation – *Calgary*

Penn West Petroleum Ltd. – *Calgary*

Talisman Energy Inc. – *Calgary, Carlyle, Chauvin (Alta.), Chauvin (Sask.), Chetwynd, Edson, Grande Prairie, Lac La Biche, Shaunavon, Turner Valley, Warburg, Windsor*

TAQA North Ltd. – *Calgary, Niton Junction*

For an up-to-date list of CIPEC Leaders, visit nrcan.gc.ca/energy/efficiency/industry/opportunities/5233.

CIPEC Trade Associations

Aerospace Industries Association of Canada (AIAC)

Alberta Food Processors Association (AFPA)

Aluminum Association of Canada (AAC)

Atlantic Dairy Council

Automotive Parts Manufacturers' Association (APMA)

Baking Association of Canada (BAC)

Beer Canada

Canadian Association for Surface Finishing (CASF)

Canadian Association of Petroleum Producers (CAPP)

Canadian Chamber of Commerce (CCC)

Canadian Construction Association (CCA)

Canadian Electricity Association (CEA)

Canadian Energy Pipeline Association (CEPA)

Canadian Fertilizer Institute (CFI)

Canadian Foundry Association (CFA)

Canadian Fuels Association

Canadian Gas Association (CGA)

Canadian Lime Institute (CLI)

Canadian Manufacturers & Exporters (CME)
- CME Alberta Division
- CME British Columbia Division
- CME Manitoba Division
- CME New Brunswick Division
- CME Newfoundland and Labrador Division
- CME Nova Scotia Division
- CME Ontario Division
- CME Prince Edward Island Division
- CME Quebec Division
- CME Saskatchewan Division

Canadian Meat Council (CMC)

Canadian Plastics Industry Association (CPIA)

Canadian Steel Producers Association (CSPA)

Canadian Vehicle Manufacturers' Association (CVMA)

Cement Association of Canada (CAC)

Chemistry Industry Association of Canada (CIAC)

Council of Forest Industries (CFI)

Electro-Federation Canada (EFC)

(The) Explorers and Producers Association of Canada (EPAC)

Fisheries Council of Canada (FCC)

Food and Beverage Ontario

Food and Consumer Products of Canada (FCPC)

Forest Products Association of Canada (FPAC)

FPInnovations

(The) Mining Association of Canada

North American Insulation Manufacturers Association (NAIMA Canada)

Ontario Agri Business Association (OABA)

Packaging Association of Canada (PAC)

Quebec Forest Industry Council (QFIC)

Rubber Association of Canada (RAC)

Wine Council of Ontario (WCO)

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