



RESPONSIBLE CARE® PROGRESS REPORT 2014

Commitment • Responsibility • Performance



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Message to our Stakeholders

On behalf of the Chemistry Industry Association of Canada (CIAC), I am delighted to present our new 2014 *Responsible Care® Progress Report: Commitment — Responsibility — Performance*.

Responsible Care is the chemistry industry's commitment to sustainability. Its ethic and principles compel companies to innovate for safer and more environmentally friendly products and processes, and to work to reduce harm throughout the entire life cycle of their products. This new report continues CIAC's 20-year tradition of measuring its members' progress against that commitment.

When we published our first *Reducing Emissions* report back in 1992, it was the only publication of its kind in Canada. Now, more than two decades later, we are still publicly reporting emissions. As this report will show, CIAC members have nearly eliminated emissions to water, substantially reduced emissions of air pollutants such as nitrogen oxides and sulphur dioxide, and reduced the global-warming potential of their operations. These are remarkable achievements.

But our new *Responsible Care® Progress Report* broadens its scope beyond just emissions — highlighting CIAC members' efforts in such areas as workplace safety, process safety, community engagement, product stewardship and transportation. Like the reports that came before it, it represents our sincere commitment to being accountable and responsive to our stakeholders, and to meeting Canadians' expectations for a socially responsible and sustainable chemistry industry.



Richard Paton
President and CEO
Chemistry Industry Association of Canada



Responsible Care® is our commitment to meeting Canadians' expectations for community and environmental protection, employee health and safety, product stewardship, and social engagement.

Overview

CIAC MEMBERS SET AN EXAMPLE of transparency and environmental stewardship for other industries in Canada and around the world. Through their commitment to Responsible Care®, our members voluntarily and publicly report their facilities' emissions, and take action to improve the overall sustainability of their operations.

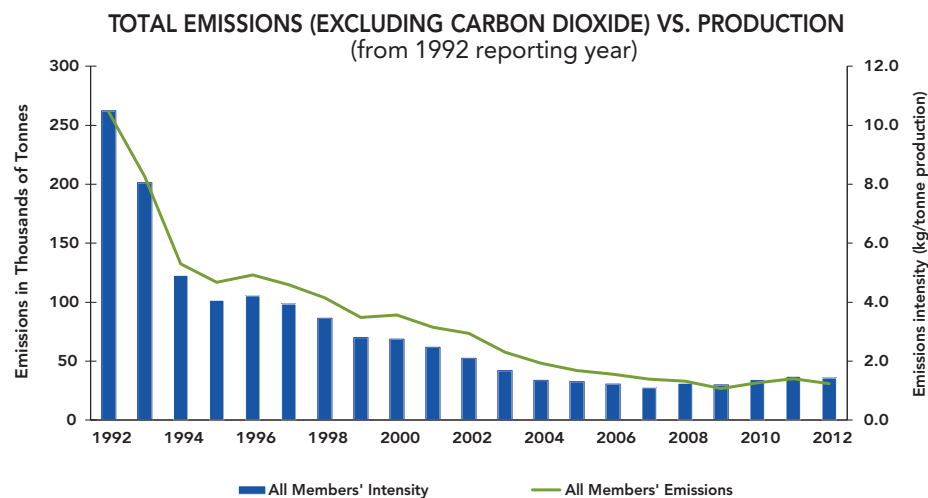
For 20 years now, the Chemistry Industry Association of Canada has published an annual *Reducing Emissions* report — highlighting members' efforts to go above the requirements of Canadian laws in reporting, and reducing their emissions. With the launch of this inaugural *Responsible Care® Progress Report*, CIAC will continue to report members' emissions, but also aims to shed light on other areas that are important to Canadians: transportation safety, workplace safety, community engagement, and waste management, to name a few.

Delivering More Than 20 Years of Results

CIAC members have made impressive emissions reductions over the past two decades. In 1992, our member-companies reported nearly 260,000 tonnes of emissions; by 2012, that was reduced to just 31,000 tonnes.

Today, a unit of Canadian chemical product is manufactured with 88 per cent fewer emissions than in 1992. As this report will show, CIAC members have also:

- reduced discharges to water by 98 per cent;
- reduced emissions of toxins targeted by the *Canadian Environmental Protection Act* by 89 per cent;
- substantially reduced emissions of air pollutants like nitrogen oxides (by 61 per cent) and sulphur dioxide (by 85 per cent);
- reduced the global-warming potential of their operations by 65 per cent;
- created workplaces that are healthier and safer than ever before — reducing the number of workplace injuries and illnesses by more than 70 per cent; and
- reduced their production of hazardous waste for disposal by 79 per cent over 1995 levels.



CIAC seeks feedback and continued guidance on its performance and reporting from the association's **National Advisory Panel** and its Environmental Protection Steering Group (a group of representatives from federal and provincial governments, environmental NGOs, academia and the chemistry industry). Other readers are encouraged to contact us with their own views and suggestions.

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About the Data

UNDER RESPONSIBLE CARE®, Chemistry Industry Association of Canada members are expected to report all substance releases to CIAC, even when the substance or amount released falls below the reporting threshold of Canada's National Pollutant Release Inventory (NPRI). In addition, CIAC members must report all workplace injuries or illnesses to CIAC on an annual basis. Company-specific data are then made publicly available on CIAC's website.

CIAC has updated its substance classifications to ensure that they are fully consistent with recent changes to the Government of Canada's [CEPA Schedule 1 List of Toxic Substances](#) and the [International Agency for Research on Cancer's classifications](#). This report provides several different definitions for toxicity, and an analysis of CIAC members' emissions according to those definitions. It should be noted that substances may overlap in those categorizations.

All of the 2012 emissions data published in this report were obtained in cooperation with Environment Canada's Single Window (SW) online reporting system. CIAC members report all releases via the association's National Emissions Reduction Masterplan (NERM) and Environment Canada's [NPRI](#).

Emissions data are based on site-specific knowledge and expertise, monitoring, mass balance calculations, published emissions factors, engineering calculations and other standardized methods.

CIAC maintains an extensive [NERM Toolbox](#) of supporting tools to guide and support its members' emissions estimates and reporting, and the association strives for continuous improvement in the quality of those estimates.

However, CIAC's membership, and the production activity of its members changes over time. In any given year, new members may join the association, while some others may leave. Some sites close, while others are expanded or new sites are established. The data contained in this report represent the release estimates for CIAC's membership as it stood in each year of reporting.

It is the intention of this publication to provide the best information available. However, neither CIAC nor its employees make any warranty, expressed or implied, or assume any liability or responsibility for any use, or the results of such use, of any information or data disclosed in this report.

Photo courtesy of NOVA Chemicals



About Responsible Care®

Responsible Care® — Our Commitment to Sustainability

LAUNCHED IN 1985 by the Chemistry Industry Association of Canada, Responsible Care inspires CIAC's member-companies to continuously improve their health, safety and environmental performance, while delivering products essential to Canadians' everyday lives.

Committing to Responsible Care is a condition of membership in CIAC. Responsible Care's rigorous codes and ethic influence all aspects of a company's business, and drive CIAC member-companies to not only meet government regulations, but to exceed them. At their core, Responsible Care companies believe that they *should do the right thing and be seen to do the right thing*.

CIAC supports its members in sustaining their commitment to Responsible Care through:

- **annual, public CEO recommitments** to the *Responsible Care® Ethic and Principles for Sustainability*;
- **leadership and technical networking opportunities** — to promote mutual assistance and peer pressure through the sharing of best practices and lessons learned;
- **critical input from the association's National Advisory Panel** — a group of academics, environmental leaders and community members which advises the industry;
- **annual performance reporting** in key areas such as health and safety, process safety, emissions, transportation incidents and resource conservation; and
- **triennial external verification** — teams of industry experts, public advocates and local citizens verify that Responsible Care's ethic and principles are in place and driving continuous improvement at each CIAC member-company, and their findings are published on CIAC's website.





The Responsible Care® Ethic and Principles for Sustainability

We are committed to doing the right thing, and being seen to do the right thing.

We dedicate ourselves, our technology and our business practices to sustainability — the betterment of society, the environment and the economy. The principles of Responsible Care® are key to our business success, and compel us to:

- work for the improvement of people's lives and the environment, while striving to do no harm
- be accountable and responsive to the public, especially our local communities, who have the right to understand the risks and benefits of what we do
- take preventative action to protect health and the environment
- innovate for safer products and processes that conserve resources and provide enhanced value
- engage with our business partners to ensure the stewardship and security of our products, services and raw materials throughout their life cycles
- understand and meet expectations for social responsibility
- work with all stakeholders for public policy and standards that enhance sustainability, act to advance legal requirements and meet or exceed their letter and spirit
- promote awareness of Responsible Care®, and inspire others to commit to these principles

Toxic Substances

CANADA'S CHEMISTRY INDUSTRY IS COMMITTED To protecting the environment and health of Canadians. Over the past 25 years, CIAC and its members have worked with governments and stakeholders to safely manage toxic substances, and ensure the safety of all Canadians.

CIAC members prioritize substances for emissions-reduction efforts based on current scientific evidence, public and community concerns, emerging global trends, and the feasibility of management options — an approach that has had demonstrable results.

Canada's Chemicals Management Plan

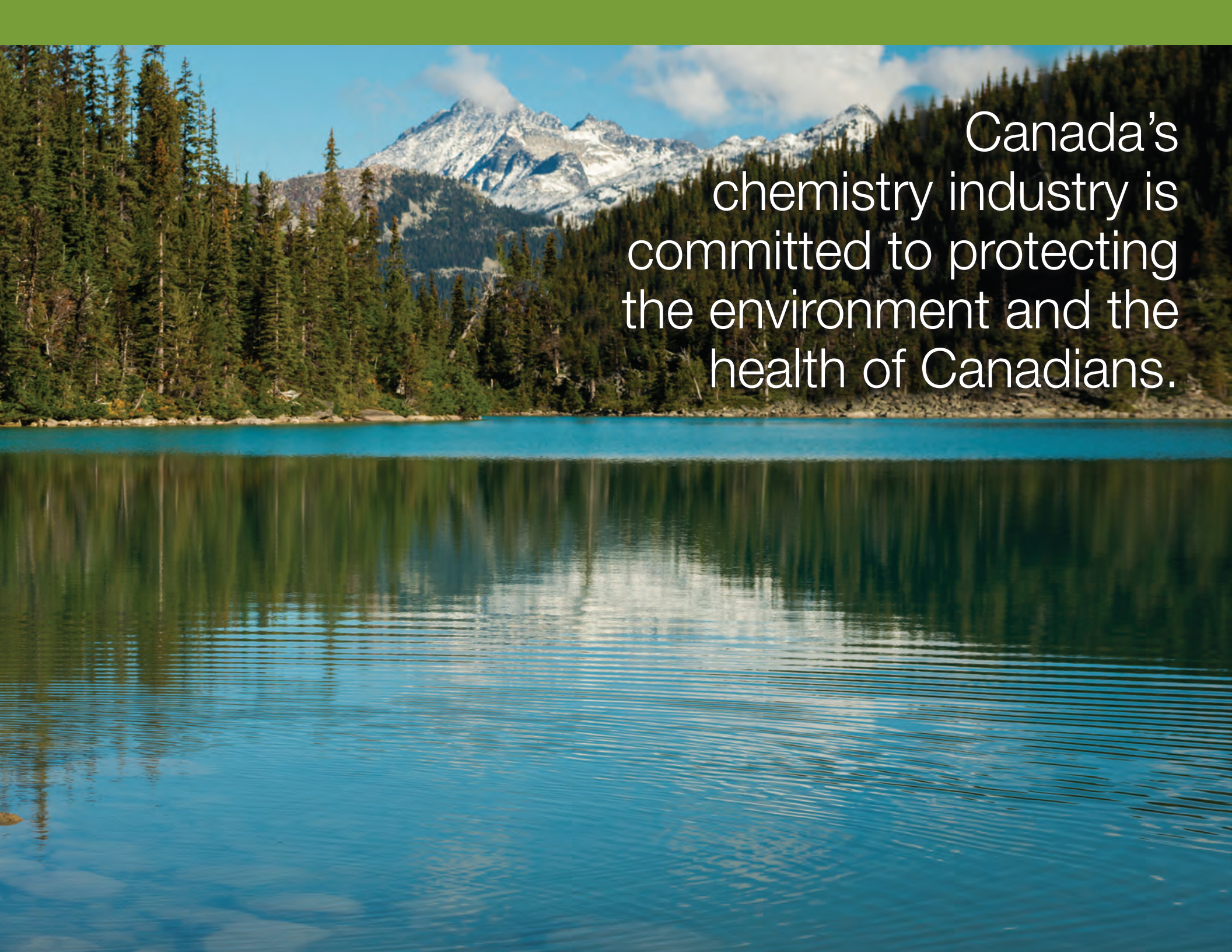
In 1999, Canada updated its cornerstone *Canadian Environmental Protection Act (CEPA 1999)*, and subsequently required more than 23,000 substances to be formally evaluated and prioritized for environmental and human health risk-assessments.

By 2006, all 23,000 substances slated for review under CEPA 1999 had undergone an initial evaluation; the federal government concluded that more than 80 per cent of them did not pose any meaningful risk, or were no longer in commercial use. The government began to gather information and conduct in-depth scientific assessments on the remaining 4,300 substances under *Canada's Chemicals Management Plan (CMP)*.

To date, assessments of the 194 highest-priority substances (otherwise known as the "Challenge to industry" substances) are nearly complete, with 42 identified as meeting the criteria for "toxic" under CEPA 1999. Work is ongoing to collect data, evaluate risk, and consider additional risk management actions for those substances. The second phase of the CMP has also begun, and progress continues to be made towards completing the assessments of all 4,300 chemicals by 2020.

Since 1992, CIAC members have reduced their emissions of the CMP's Challenge to industry substances by 69 per cent.





Canada's
chemistry industry is
committed to protecting
the environment and the
health of Canadians.



LANXESS CANADA INVESTS IN CMP-TARGETED EMISSIONS REDUCTIONS

IN 2013, **LANXESS** completed a major project aimed at reducing its emissions of volatile organic compounds (VOCs) — substances that contribute to the formation of smog. The project targeted emissions of isoprene, isobutylene, and methyl chloride. Two of those — isoprene and methyl chloride — were assessed as high-priority substances under Canada's Chemicals Management Plan, and isoprene was targeted for emissions reductions.

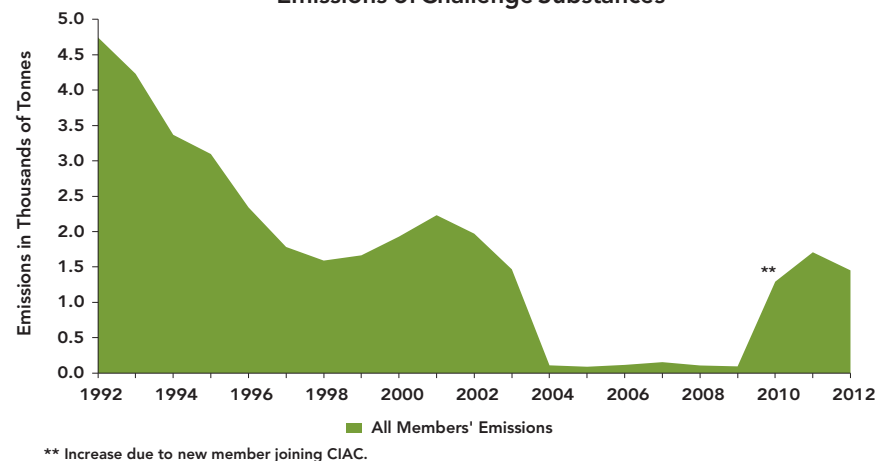
LANXESS installed a new \$10-million regenerative thermal oxidizer (RTO) at its Sarnia, Ont. facility to control VOCs emitted from the site's synthetic butyl rubber unit — reducing emissions of isoprene, isobutylene, and methyl chloride by more than 80 per cent.

The new RTO is also highly energy efficient; it consumes significantly less natural gas than other VOC-control technologies, which will lead to less fuel consumption and fewer emissions of greenhouse gases over the long term.

As a Responsible Care® company, LANXESS has made significant strides in managing its use of CMP-targeted substances, and will continue to seek ways to further reduce the environmental impact of its Sarnia operation in the coming years.



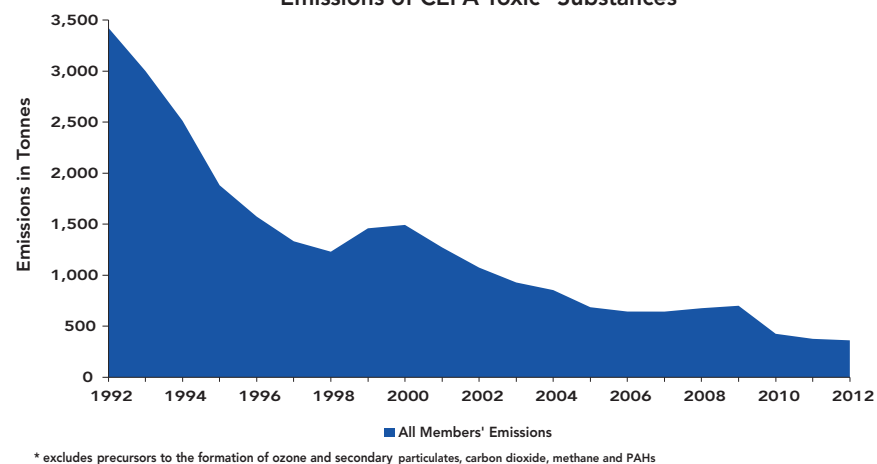
CANADA'S CHEMICALS MANAGEMENT PLAN Emissions of Challenge Substances



CEPA Toxics

Under CEPA 1999, a substance is defined as "toxic" based on a scientific evaluation of its potential to harm human health or the environment, and the ways in which exposure may occur. Substances that are deemed to be toxic are listed on the Government of Canada's [CEPA Schedule 1 List of Toxic Substances](#).

CANADIAN ENVIRONMENTAL PROTECTION ACT Emissions of CEPA Toxic* Substances

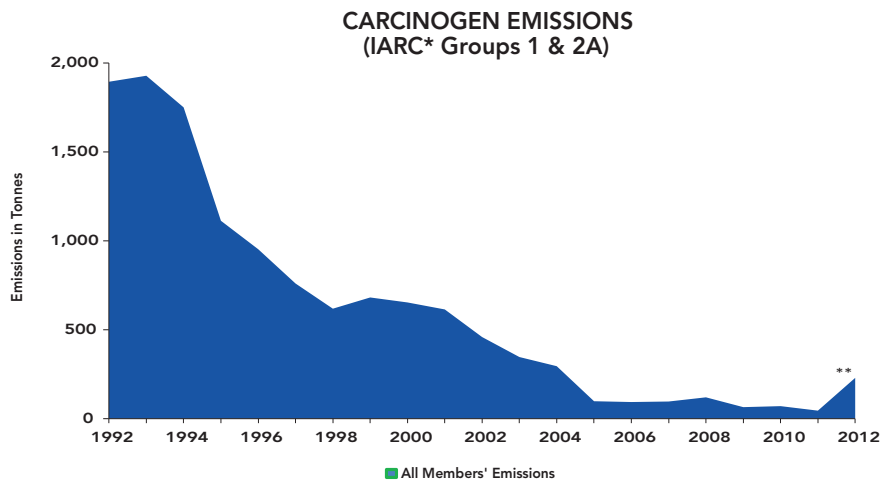


Since 1992, CIAC members have achieved an overall 89 per cent reduction in emissions of substances defined as toxic by the *Canadian Environmental Protection Act*.

IARC Carcinogens

Carcinogens are substances that can cause cancer, and for that reason, may be considered toxic. [The International Agency for Research on Cancer](#) (IARC) classifies substances based on scientific evidence of their carcinogenicity; Group 1 consists of substances that are known to be carcinogenic to humans, and Group 2A includes substances that are probably carcinogenic to humans.

Since 1992, CIAC members have achieved an overall 88 per cent reduction in emissions of Group 1 and 2A IARC-classified carcinogens.



* World Health Organization International Agency for Research on Cancer

** Increase due to substance list review completed in 2012 and addition of sulphuric acid to IARC List 1



Air Quality

MAINTAINING THE QUALITY OF THE AIR that we breathe is essential to the health of all Canadians.

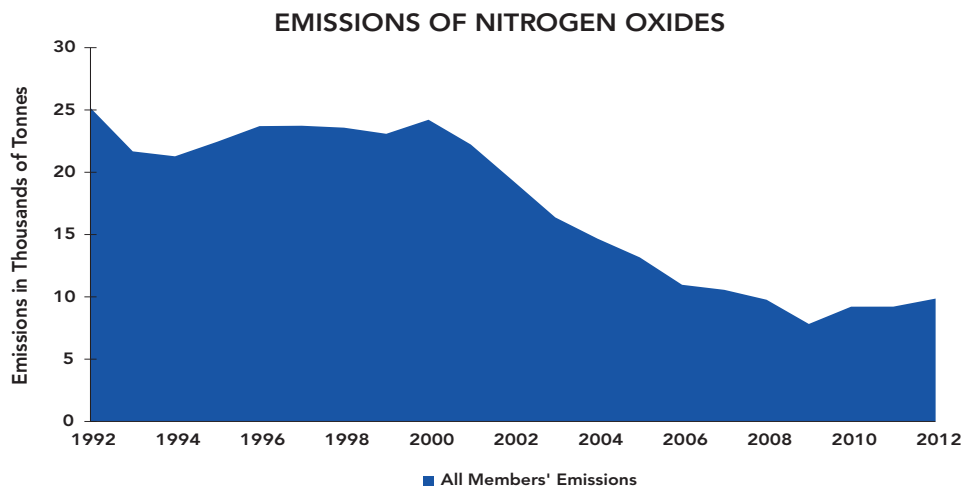
For more than two decades, Canada's chemistry industry has been working hard to reduce emissions of pollutants that affect air quality. CIAC and its member-companies have also been active participants in the development of Canada's **Air Quality Management System** (AQMS) — a groundbreaking collaboration between industry, non-governmental organizations, and federal and provincial governments.

The following pages outline the chemistry industry's progress in reducing emissions of a number of air pollutants, including nitrogen oxides, sulphur dioxide, and volatile organic compounds.

Reducing Emissions of Nitrogen Oxides

Nitrogen oxides (NO_x) are released during the combustion of fossil fuels — primarily by vehicles — and have a detrimental effect on air quality.

CIAC's member-companies contribute very little to Canada's nitrogen oxide emissions, but have nevertheless made it a priority to reduce them. Over the past 21 years, CIAC members have achieved a 61 per cent reduction in NO_x emissions.



Canada's chemistry industry
has made it a priority to reduce
NO_x emissions and contribute to
cleaner air for all Canadians.





DOW'S FORT SASKATCHEWAN POWER PLANT INNOVATES TO REDUCE NO_x EMISSIONS

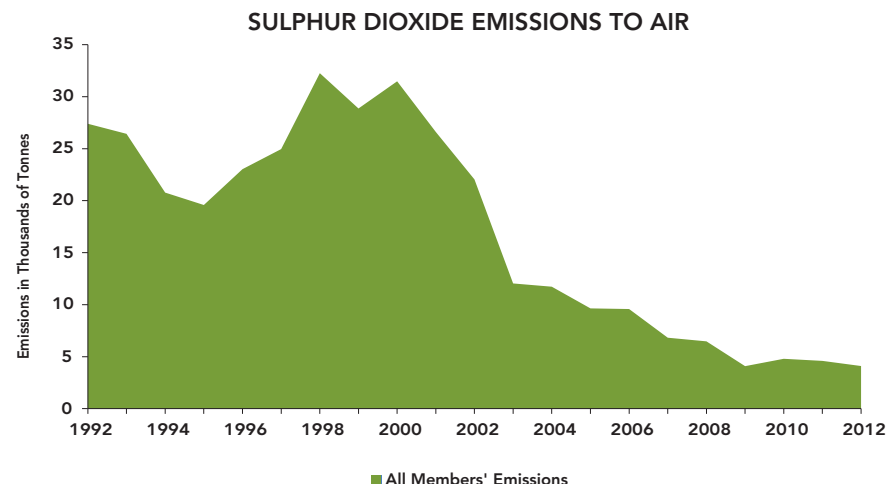
DOW CHEMICAL CANADA has successfully reduced the NO_x emissions at its cogeneration plant in Fort Saskatchewan, Alta. by more than 90 per cent. The project, which began several years ago, was motivated by changes to the [Alberta Air Emission Standards for Electricity Generation](#).

Cogeneration is the simultaneous production of electricity and steam from a single energy source. When fossil fuels are burned to generate electricity, cogeneration recovers energy that would normally be wasted, and uses it to produce heat or steam for chemical manufacturing processes.

Working in partnership with GE Canada, Dow was able to upgrade its cogeneration plant's 30-year-old control system to reduce the plant's NO_x emissions.

"GE and Dow have a long history of working together to provide efficient, environmentally friendly energy to Dow's operations," says Dwayne Aasberg, Commercial Manager, Energy, at Dow Chemical Canada. "That experience of teamwork definitely benefited this project."

This project ensures that Dow will be able to comply with current — and future — emissions regulations, and demonstrates the company's commitment to sustainability.



Sulphur Dioxide Reductions

Sulphur dioxide (SO₂) is a colourless gas and one of the main causes of acid rain, which can damage crops, forests, and entire ecosystems. Sulphur dioxide has also been recognized as a precursor of fine particulate matter, which affects air quality.

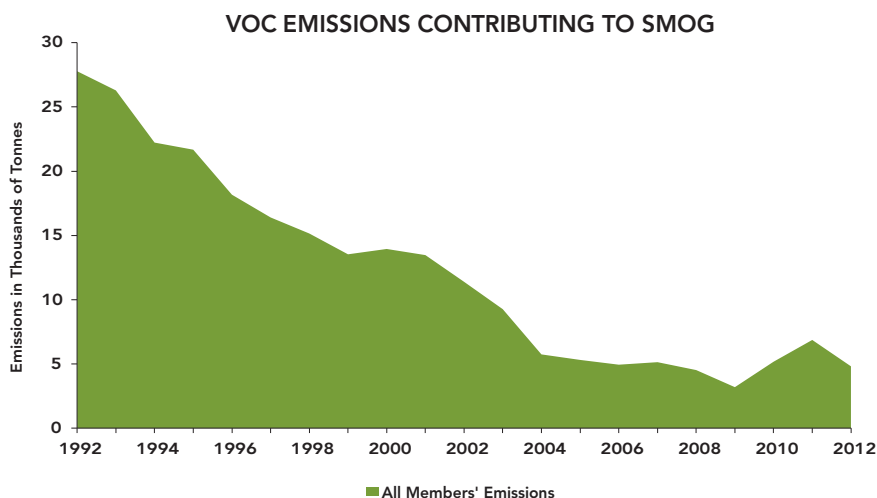
Over the past two decades, CIAC member-companies have placed a high priority on reducing SO₂ emissions, resulting in an 85 per cent reduction since 1992.

Reducing VOC Emissions

Volatile organic compounds (VOCs) are carbon-containing substances that come from everyday products such as gasoline, solvents, and oil-based paint. In the presence of sunlight, VOCs react with nitrogen oxides (NO_x) to form ground-level ozone, which affects air quality. When mixed with sulphur dioxide (SO₂) in the atmosphere, VOCs also create particulate matter — another key air pollutant.

In 1997, CIAC's top-25 VOC-emitting member-companies signed a Memorandum of Understanding with Environment Canada, and committed to voluntarily reducing their VOC emissions to 25 per cent below 1997 levels. Not only





was that target reached within five years, but by 2012, CIAC's members had reduced their VOC emissions by more than 83 per cent below 1992 levels.

CIAC members achieved this by:

- reformulating products;
- making changes to production processes;
- improving emission-control devices;
- improving the detection and repair of leaks from process equipment; and by
- preventing vapour leakage from storage tanks and during product loading.



Chemtrade Montreal site

BASF Windsor
Distributed Control
System Operator



CHEMTRADE'S MONTREAL FACILITY SIGNIFICANTLY REDUCES SO₂ EMISSIONS

CHEMTRADE provides industrial chemicals and services to customers in North America and around the world.

Over the past 15 years, considerable investments and improvements have been made at the company's Montreal site (which removes sulphur from refinery effluent), to reduce its SO₂ emissions to the atmosphere. These improvements included the installation of high-tech scrubber systems and process control equipment. In 1999, a tail gas unit was replaced with a first-of-its-kind two-stage caustic scrubber, and further enhancements were made in 2006 and again in 2011. As a result, Chemtrade was able to reduce its Montreal facility's SO₂ emissions by more than 97 per cent.



BASF CANADA SLASHES VOC EMISSIONS AT ITS WINDSOR PAINT PLANT

In less than two years, **BASF CANADA** has reduced the volatile organic compound (VOC) emissions at its Windsor, Ont. paint plant by more than 50 per cent.

BASF's Windsor site produces water and solvent-based coatings for automotive assembly plants across North America. Traditionally, the plant's equipment was rinsed three or four times with an organic solvent following the manufacture of each batch. This was a significant source of VOC emissions.

In 2011, BASF completed a major production expansion project at the site, which resulted in a more than 15-tonne increase in VOC emissions. However, BASF Canada took action and was able to cut its emissions by reducing the VOC content of its cleaning solvents.

These changes, along with other process improvements, enabled BASF Canada's Windsor paint plant to reduce its VOC emissions from 81 tonnes in 2011 to 37 tonnes in 2012 — bringing the site well below its pre-expansion VOC emission levels.



MEGlobal FOCUSES ON REDUCING GREENHOUSE GASES

MEGlobal is a world leader in the manufacture and marketing of ethylene glycol, with facilities in Fort Saskatchewan and Prentiss, Alta. Ethylene glycol is used as a raw material in the manufacture of everyday products such as polyester fibres and antifreeze.

In 2007, the company launched FOCUS2012, an ambitious five-year sustainability plan. Targets were set in a number of key areas, including a goal to reduce carbon dioxide (CO₂) emissions by 40 per cent.

To meet these targets, MEGlobal launched a series of projects to increase raw material efficiency, implement technology and process enhancements, and develop business relationships through which its CO₂ byproduct could be used.

By the end of 2012, the company had exceeded its FOCUS2012 target, reducing its CO₂ emissions by 59 per cent. But MEGlobal isn't stopping there. The company has launched FOCUS2020 — its next set of sustainability goals — and has set itself the goal of further reducing its CO₂ emissions by 30 per cent.

For more information on MEGlobal, visit: www.meglobal.biz/environment/2020-goals

Climate Change

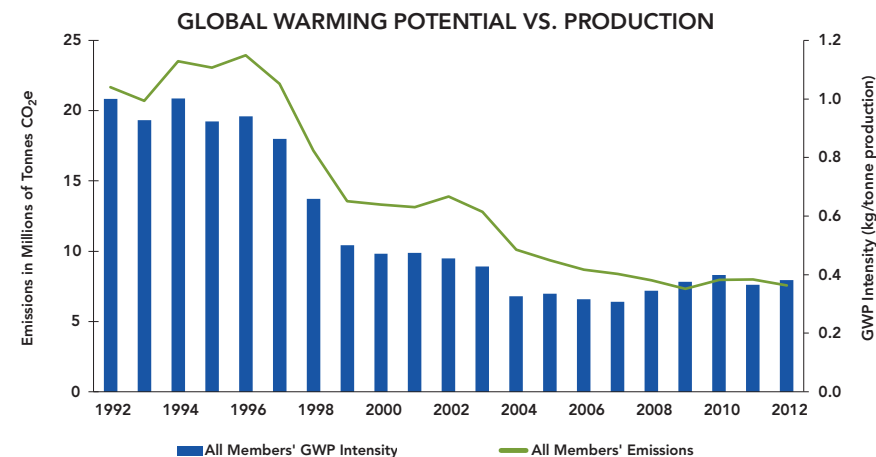
Reducing Carbon Dioxide Emissions

Canadians are more concerned than ever about climate change, and Canada's chemistry industry is committed to doing its part to address the issue, by reducing greenhouse gas emissions.

Since 1992, CIAC members have worked hard to reduce these emissions through operational efficiencies and product innovation — cutting their carbon dioxide emissions by 37 per cent, and reducing the global warming potential of their operations by 65 per cent.

These emissions reductions were achieved as a result of:

- investments in new plants and technologies;
- efforts to conserve energy, through improved energy and emissions tracking;
- investments in combined heat and power facilities;
- substitutions of lower-carbon fuels;
- process changes; and
- replacements or upgrades of older boilers and heaters.



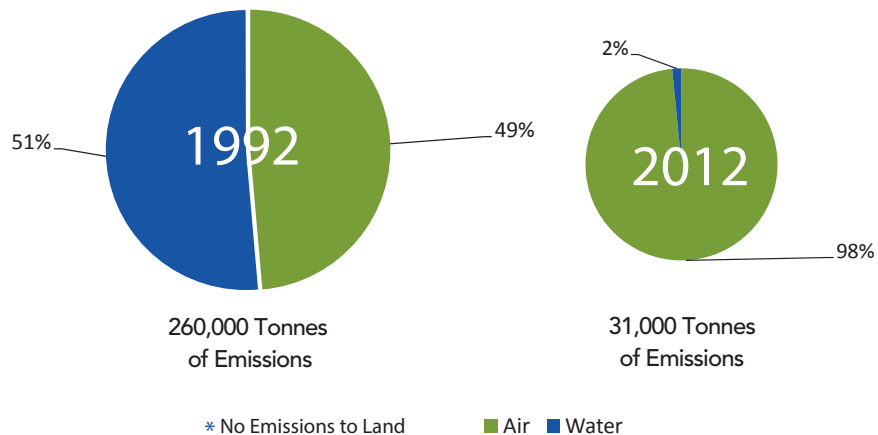
Water Quality

WATER HAS PLAYED AN IMPORTANT ROLE in Canada's development, both in terms of its economy, and its identity. As a result, Canadians place a high priority on protecting water from pollution, and on conserving it for future generations — a commitment shared by CIAC and its members.

Twenty years ago, almost half of our members' emissions were discharged into water. Today, less than 2 per cent of their emissions enter waterways.

Through their commitment to Responsible Care®, CIAC members are expected to act as responsible stewards of water resources. They must conserve and minimize their use of water, ensure the protection of water quality, and control effluent streams to protect water bodies, groundwater, and associated habitats.

CIAC MEMBERS' EMISSIONS TO WATER AND AIR*



PDI CONSERVES WATER AND IMPROVES WATER TREATMENT AT ITS GUELPH TERMINAL

PDI is a leading logistics provider to the chemistry industry, offering full-service bulk trucking, warehousing, custom packaging, and logistics services to companies across North America.

As part of its commitment to Responsible Care, the company is working to conserve water at its Guelph, Ont. chemical terminal — reducing its consumption by as much as 21,000 gallons per day. To achieve this reduction, PDI installed a water recycling system for effluents generated at its tanker wash facility. All effluents are now separated, allowing for the reuse of hot water for subsequent wash processes.

The company is also planning to restart its municipal-scale wastewater treatment system in Guelph. This facility will allow PDI to further improve its waste treatment and water-recycling capabilities, by managing all effluents and recycling efforts in-house.

By taking full advantage of existing assets and reducing its water usage, PDI is living up to its Responsible Care commitment — working towards environmental sustainability today, and in the future.

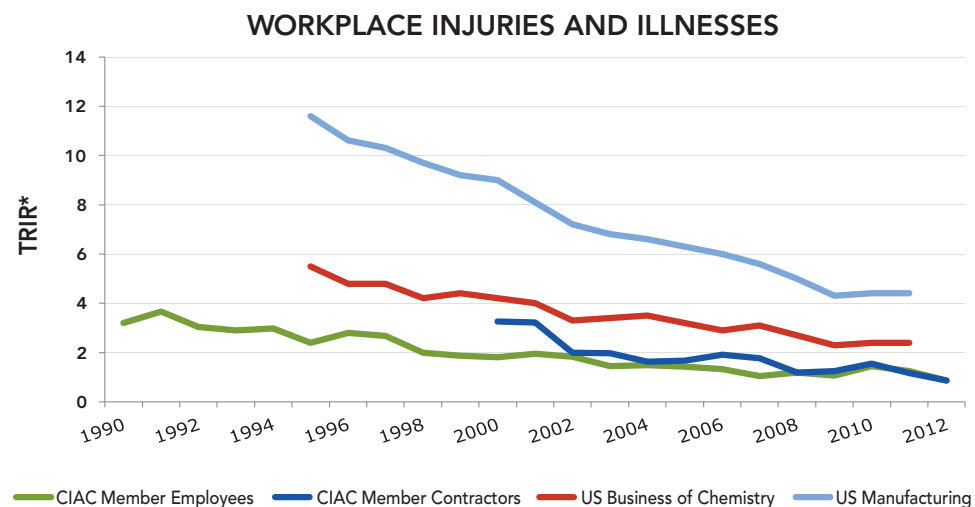


Safety

Workplace Health & Safety

For more than 30 years, CIAC members have been striving to create workplaces that are as healthy and safe as possible. Initiatives such as SHARE (the association's Safety, Health, Analysis, Recognition and Exchange network), have been instrumental in achieving that goal. SHARE brings together CIAC member-company health and safety professionals, who are committed to measuring, tracking, and continuously improving performance — with the ultimate goal of achieving zero workplace injuries and illnesses.

By 2012, CIAC members had reduced the number of injuries and illnesses at their facilities by more than 70 per cent over 1990 levels. Today, they are expanding their efforts, and extending their safety programs to contractors and other service-providers, to ensure the safety of everyone who is involved in the business of chemistry.



*Total Recordable Incident Rate (TRIR) is calculated as the number of recordable incidents for each 100 workers per year, based on 2,000 hours worked per person per year

Photo courtesy of NOVA Chemicals



For more than 30 years,
CIAC members have been
striving to create workplaces
that are as healthy and
safe as possible.





FMC EMPOWERS EMPLOYEES TO "OWN SAFETY"

In 2012, **FMC OF CANADA LTD.** won CIAC's Excellence in Safety Award for the thirteenth consecutive year. The company's Prince George, B.C. facility has manufactured and handled hydrogen peroxide for more than a decade without any recordable injury, and for more than 20 years without a single lost-time accident.

FMC's strong safety culture begins with its hiring process; the company believes that attracting new employees who possess an awareness and understanding of safety is key. FMC's employees are empowered to raise, and resolve, issues through the company's "employee ownership of safety" program. Every employee is involved in planning work strategies, and in dealing directly with any safety issues that arise. As a Responsible Care® company, FMC instills its employees with the idea that safety is just as important as productivity — understanding that you can't put a price on safety.

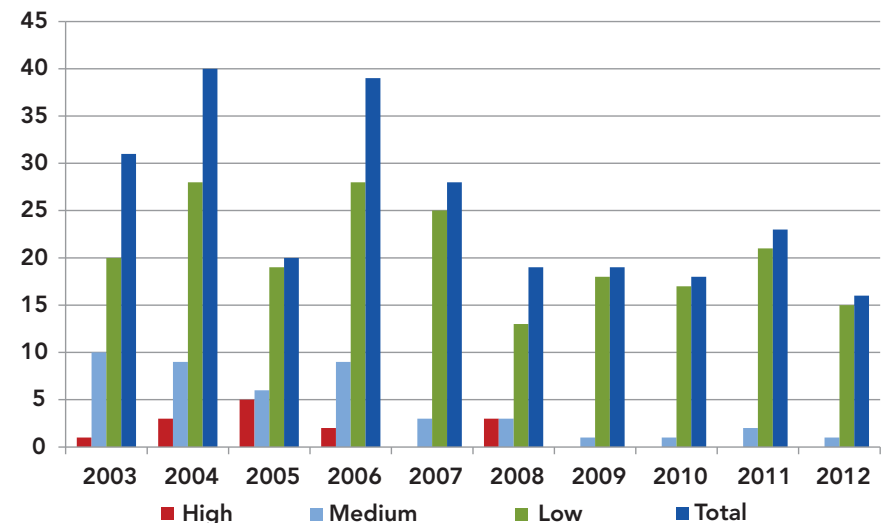
Process Safety

Safety is first and foremost at any Responsible Care® company. Whether it's biochemistry, petrochemistry or chlorine chemistry, chemical processes can involve high temperatures, high pressures, flammable and explosive mixtures, and other significant physical and chemical hazards.

To protect workers, the public, and the environment, CIAC member-companies must have comprehensive process-safety management systems in place, and adhere to **standards established by the Canadian Society for Chemical Engineering**. Any gaps between a company's management system and the standard must be assessed, and action plans developed and implemented to raise the company's process safety to an acceptable level. A comprehensive examination of a company's process-safety management system is also a fundamental component of Responsible Care's triennial verification process.

The chart below demonstrates how CIAC's approach to process-safety management has led to a significant decrease in the number, and severity of process-related incidents over the past 10 years.

SEVERITY OF TOTAL REPORTED PROCESS SAFETY INCIDENTS



CIAC Contributes to OECD's Guidance Document on Process Safety

In 2010, the Organization for Economic Co-operation and Development's Working Group on Chemical Accidents struck a task force to develop its **Process Safety Guidance for Senior Leaders in High Hazard Industries**. CIAC and several of its member-companies were active participants in the task force, and contributed their voice and expertise to the resulting document.

Published in 2012, the OECD's guidance document identifies the essential elements that companies should have in place to ensure process safety:

- leadership and culture that are open to process safety concerns;
- leadership that is understanding of vulnerabilities and risks;
- robust management systems to drive continuous improvement;
- process-safety competencies at the Board and executive levels; and
- a CEO who pays personal attention to process-safety monitoring and planning.

Transportation Safety

Every day, chemicals are transported through our communities — whether by rail, road, or pipeline. Ensuring their safe and secure transportation is of paramount importance to CIAC and its members.

Through TransCAER®, a voluntary initiative led by CIAC and the Railway Association of Canada, CIAC members work closely with communities along transportation routes, to ensure that residents, municipal officials, and first responders are aware of any hazards associated with their products. They also ensure that communities are well-informed of the steps that companies are taking to reduce risks, and help communities to prepare for — and respond to — a potential transportation incident involving dangerous goods.

Responsible Care compels CIAC's member-companies to develop transportation safety plans that favour:

- the safest mode possible for transporting their products (whether rail, road, or pipeline);
- the safest route possible, while taking action to reduce any risks associated with that route; and



STEPAN CANADA INVESTS \$1.25 MILLION TO REDUCE RISK OF ETHYLENE OXIDE RELEASE

STEPAN CANADA's facility in Longford Mills, Ont. produces surfactants, a key ingredient in many consumer and industrial cleaning products: from detergents, to shampoos, cosmetics, and adhesives.

Although surfactants are not harmful to humans or the environment, ethylene oxide (EO) — which is a severe inhalation hazard, and extremely flammable — is used to manufacture them. Stepan Canada places the utmost priority on preventing any unintentional release of ethylene oxide, through its stringent process-safety management system.

In 2013, Stepan invested \$750,000 at its Longford Mills facility, to replace its EO scrubber with a new model that has a 99.96 per cent EO removal rate. The company also spent more than \$500,000 to insulate its EO storage tank, to protect it in the event of a fire elsewhere in the facility. As part of that project, the storage tank was also equipped with new instruments to detect even very low-level leaks, making the Longford Mills facility safer for both employees and the community at large.





NORFALCO: SAFELY DELIVERING SULPHURIC ACID

NORFALCO is a recognized leader in the safe and environmentally sound distribution of sulphuric acid — an essential ingredient in the manufacture of everyday products such as paints and pigments, fertilizers, pulp and paper, plastics, detergents, textiles, and batteries.

As part of its TransCAER® commitment, NorFalco regularly holds seminars with truck and rail carriers, storage terminal operators, emergency responders, government officials and inspectors, and communities. These seminars provide participants with invaluable information about first aid and personal protective equipment requirements, safe loading and unloading procedures, tank and equipment cleaning and inspection, regulatory requirements, and security and incident reporting.

In addition, NorFalco hosts on-site customer seminars and online training courses, and conducts comprehensive reviews of equipment and procedures, to ensure the safe delivery and handling of sulphuric acid.

To find out more, please visit www.norfalco.com.

NorFalco emergency response training workshop.



TransCAER® training event in Tillsonburg, Ont. Photo credit: Sun Media, 2013

- the safest transportation carrier, as determined by CIAC's motor carrier and rail carrier evaluation criteria.

CIAC members must have an emergency response plan in place that demonstrates their capacity to safely and efficiently respond, contain, and mitigate any chemical transportation incident. They must also engage reputable and qualified emergency response service-providers and technical advisors, to respond to questions and provide advice on managing any incident.

Following the tragedy in Lac-Mégantic, Que. in 2013, Transport Minister Lisa Raitt **recognized Responsible Care as a model of transparency and emergency preparedness** in dangerous goods transportation, and encouraged other industries to implement similar initiatives.

Community Safety

Being a good neighbour is a fundamental part of being a Responsible Care® company. CIAC members are accountable and responsive to the public — especially to the local communities in which they do business. Those communities have the right to know the risks and benefits of what Responsible Care companies do.

In addition to maintaining strong process-safety management systems, CIAC members must also have site-specific emergency management plans in place. Companies must demonstrate:

- that they have the capacity to safely and efficiently respond, contain, and mitigate the effects of an incident involving their operations; and
- that they have tested their plan, with the active participation of other industries, officials, first responders, and members of the media in their communities.

Responsible Care's principle of the "public's right to know" means that CIAC members must encourage an open dialogue with local citizens, and ensure that they are aware of:

- any hazards associated with members' operations;
- what members are doing to reduce the risks associated with their operations, and the transportation of their products; and
- the specifics of their local emergency warning system, and what they need to do to protect themselves and their families in the event of a chemical incident in their community.



WORKING TOGETHER FOR A SAFER COMMUNITY IN VARENNES, QUE.

Responsible Care® companies are collaborating to create a safer community in Varennes, Que., through the "Comité mixte municipal-industriel" (CMMI). Established in 1998, the CMMI is a highly effective partnership dedicated to risk analysis, prevention, intervention, and communication of major industrial risks.

The CMMI brings together CIAC members (including Kronos, Dow Chemical Canada, and Pétromont), as well as municipal, provincial and federal representatives, other industries, the media, first responders, and citizens.

Through their involvement with the CMMI, CIAC members have taken steps to reduce the risks and potential impact of their operations on the public and the environment. More importantly, their efforts ensure that their employees, first responders, and the citizens of Varennes are prepared to respond to a potential incident involving dangerous goods in their community.

As founding members, Kronos, Dow Chemical Canada, and Pétromont are proud to be part of the Varennes CMMI — working with other stakeholders to ensure a safer community. That's Responsible Care at work.

For more details, and to view a video about the Varennes CMMI, visit the city's website: <http://ville.varennes.qc.ca/citoyens-securete/securitepublique>

Waterskier on the St. Lawrence, Varennes, Quebec.





DUPONT BUILDING INNOVATIONS ACHIEVES ZERO LANDFILL STATUS

In 2012, after three years of focused effort, **DUPONT BUILDING INNOVATIONS** succeeded in becoming a landfill-free enterprise; the company went from producing 37 million kilograms of landfill waste annually, to producing zero. This impressive decrease was achieved by reducing, reusing, and recycling manufacturing byproducts and waste at its 15 global manufacturing sites, including its plant in Thetford Mines, Que.

Through its **“Drive to Zero”** landfill program, none of the waste generated in manufacturing DuPont™ Corian® solid surfaces, DuPont™ Zodiaq® quartz surfaces, or DuPont™ Tyvek® weatherization systems and geosynthetic textiles is now sent to landfills. The project also targets manufacturing byproducts, raw materials, product scrap, construction debris, and even cafeteria waste at its manufacturing and partner sites.

By completely eliminating its landfill waste, DuPont Building Innovations has created a new standard for environmental stewardship.

Resource Conservation

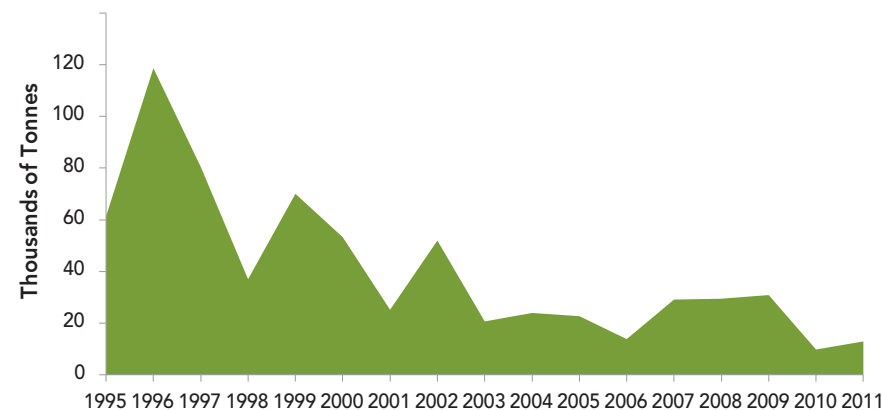
Waste Reduction

Waste has traditionally been considered an unavoidable part of many production processes.

But Responsible Care® drives companies to find innovative ways to eliminate waste throughout the entire life cycle of their products — from their design, production and distribution, to their use by customers, and beyond. CIAC members are continuously working to improve their waste-management systems, to eliminate waste at its source, and to influence their supply-chains to reduce packaging waste.

When CIAC began waste reporting in 1995, our members produced more than 61,400 tonnes of hazardous waste for disposal. By 2011, that number had been reduced to 13,000 tonnes — a reduction of nearly 80 per cent.

HAZARDOUS WASTE FOR DISPOSAL



Energy Efficiency

Responsible Care® encourages CIAC members to improve their energy efficiency, conserve resources, and reduce their emissions. Through careful monitoring of their energy usage over the past 20 years, CIAC members and partners have implemented formal energy management systems, and taken action to improve the energy efficiency of their operations. This has led to:

- process and process-control improvements;
- advanced maintenance programs;
- motor, compressor, and other equipment upgrades; and
- lighting and insulation improvements.

Reducing Water Consumption

Canada possesses almost 20 per cent of the world's fresh water — more than any other country, with the exception of Russia and Brazil. Almost 9 per cent of the Canadian landscape is covered with fresh water. Despite its abundance, water remains a precious resource — one that Canadians want to preserve.

CIAC members use water in both their manufacturing processes and products, and they are committed to water conservation. In 2012, CIAC member-companies began reporting their water usage through a standardized metric, which will allow baseline water-consumption levels to be established and used for peer-to-peer benchmarking. Based on this data, CIAC expects to be able to report on its members' water usage in its next *Responsible Care® Progress Report*.



ERCO BUCKINGHAM RECOGNIZED FOR ENERGY EXCELLENCE

In 2013, **ERCO WORLDWIDE's** Buckingham, Que. plant became the only chemical facility — and just one of nine industrial and commercial installations in the province — to be recognized by Hydro-Québec as an "Elite Energy Saver".

ERCO has implemented more than 50 energy efficiency projects at its Buckingham sodium chlorate production facility. These have reduced the plant's electricity consumption by more than six per cent, and saved more than 50 GWh of electricity a year — the amount needed to power 3,000 Quebec households. As an added benefit, ERCO's energy efficiency improvements have contributed to a more than 90 per cent reduction in carbon dioxide emissions from the facility.

In order to achieve its Elite Energy Saver status, ERCO Buckingham also had to implement formal energy efficiency policies, establish and use energy efficiency performance indicators, and nominate an in-house energy efficiency representative.

"ERCO Worldwide is a recognized energy efficiency ambassador in the Quebec chemistry sector." ~ Hydro-Québec





METHANEX FOCUSES ON STEWARDSHIP — FROM START TO FINISH

Product stewardship is front and centre at **METHANEX** — a global leader in the production and marketing of methanol. By minimizing risks at critical points in the methanol value-chain — product transportation, distribution, storage, and use — Methanex is doing its part to protect the public, the environment, and communities in every country where it operates.

All Methanex ocean-going ships must pass a yearly inspection based on the Chemical Distribution Institute's marine protocol. In addition, all contracted barge operations are audited to ensure the safe transportation of methanol on inland rivers. More than three-quarters of company-owned or contracted methanol storage terminals have also been audited against the Chemical Distribution Institute's terminal protocol.

Methanex also regularly holds methanol-focused safety seminars in countries where it operates, including Japan, Trinidad, Egypt, New Zealand, and Brazil. In Chile, Methanex has worked with customers and transportation partners to develop a road "spot test" program to assess the performance of truck drivers. The program was implemented in neighbouring Brazil in 2011, and has been used to inspect more than 12,000 truckloads of product at Brazil's Cattalini terminal.



Stewardship

STEWARDSHIP IS A PILLAR of Responsible Care®; everyone involved in the life cycle of a product must take responsibility for reducing any environmental, health, or safety risks associated with it. CIAC member-companies develop close working relationships with suppliers, distributors, logistics service-providers, and customers, and implement processes to ensure:

- ongoing evaluation of products, to achieve the most efficient use of resources, and to reduce risks associated with raw materials and products;
- employees and the public know and understand the inherent hazards, risks, and benefits of each of the company's products;
- customer procedures and equipment are reviewed prior to the first sale, and that follow-up reviews are conducted on an ongoing basis;
- sales of chemical products are prohibited, unless there is reasonable assurance of the customer or supplier's intent and ability to properly manage those substances; and
- suppliers' performance is reviewed regularly, to drive continuous improvement throughout the value-chain.

Responsible Distribution®

Since 1997, CIAC member-companies have worked in partnership with the **Canadian Association of Chemical Distributors (CACD)**, to ensure the sound stewardship of chemical products throughout their distribution networks. Responsible Distribution® is the result of this partnership.

Based on eight guiding principles, the program governs all aspects of a company's actions as they relate to the distribution of chemicals, chemical products, and chemical services. Companies commit to being accountable, and to acting in socially responsible ways at all times. They are subjected to third-party verifications every three years by SAI Global, a world-leading company that provides independent audits.

Distribution companies that have been verified to the Responsible Distribution standards are recognized as Responsible Care companies, and have the opportunity to use the Responsible Care logo and trademarks.

Investment and Innovation

RESPONSIBLE CARE® COMPANIES ARE CONSTANTLY STRIVING to create safer products and processes; ones that conserve resources, and bring greater value to their customers. Innovation is a key part of the Responsible Care ethic and principles. Responsible Care's triple-bottom-line approach stresses the importance of economic success as a contributor to improved environmental performance, and enhanced social benefits.

Over the past decade, Canada's chemistry industry has seen very little new investment. However, in 2012, CIAC members — including BioAmber, Cytec, NOVA Chemicals, Canexus, ERCO Worldwide, INEOS, and Methanex — invested close to \$2 billion in new chemical production capacity in Canada. CIAC projects that another \$10 billion could be attracted to the country over the coming decade. This trend has been driven by a number of factors, including:

- the impact of the shale gas revolution on petrochemical competitiveness;
- the combined federal and provincial corporate tax rate of 25 per cent in key provinces;
- the accelerated capital cost allowance provisions for new manufacturing machinery; and
- the commercialization of new technologies for producing chemicals from biomass.

These current and anticipated future investments will deliver benefits to Canadian communities, by creating more jobs and tax revenue, while providing environmental improvements through the use of newer, more efficient processes and technologies.



NOVA CHEMICALS INVESTS IN A MORE SUSTAINABLE PRODUCT

NOVA CHEMICALS is a leading producer of plastics and chemicals that make everyday life easier, healthier, and safer. Through its long-term asset strategy, NOVA 2020, the company is innovating for a more sustainable future by capitalizing on emerging feedstock sources.

NOVA has invested \$250 million to convert its Corunna, Ont. facility to one that uses up to 100 per cent natural gas liquids feedstock. This change, along with process improvements and the use of new fuel sources, is expected to significantly reduce the plant's emissions of oxides of sulphur and nitrogen — key air pollutants — and carbon dioxide (a greenhouse gas).

NOVA is also investing close to \$1 billion to build an efficient, world-scale linear low-density polyethylene (LLDPE) line at its Joffre, Alta. facility. This is expected to be the first new LLDPE facility built in North America in more than a decade, and will take advantage of innovative feedstock sources.

As a Responsible Care® company, NOVA Chemicals is committed to innovation that protects the public's health, safety and security, and ensures environmental stewardship.

Construction is underway to expand NOVA Chemicals' Joffre, AB manufacturing facility.





LANXESS CELEBRATES 20 YEARS OF COMMUNITY COLLABORATION

LANXESS is a world leader in the development, manufacturing and marketing of plastics, rubber, intermediates, and specialty chemicals. For 20 years, the company's Sarnia, Ont. operation has turned to local residents for input and suggestions on how LANXESS can best serve its community.

In April 2013, LANXESS hosted a reception at its Sarnia site, to celebrate the twentieth year and hundredth meeting of its Community Advisory Panel (CAP).

"It has been an interesting and immensely enjoyable undertaking, and a demonstration of tolerance, respect, curiosity and honour, and above all, a strong sense of community," said CAP facilitator Phil Brown, speaking on behalf of the panel.

Brown believes that one of the key reasons for the Community Advisory Panel's ongoing success is the "Questions from Panel Members" item, which appears early on the agenda at every CAP meeting. According to Brown, it "provides the opportunity for real community input, with senior site management often being pressed to respond to difficult and pointed questions."

As a Responsible Care® member, LANXESS is proud to work with its Community Advisory Panel, to ensure that the common interests of the company and the people of Sarnia continue to be served.



Community Dialogue and Engagement

RESPONSIBLE CARE® COMPANIES BELIEVE that the public — particularly those living in communities where they do business — have the right to understand the risks and benefits of being their neighbours. CIAC member-companies foster ongoing community awareness and dialogue processes that:

- allow companies to better understand the community's concerns, needs, and aspirations, as well as their expectations for corporate social responsibility;
- provide proactive information about their operations, products, services, waste, social impacts, benefits, hazards and associated risks, up to and including worst-case scenarios;



LANXESS Community Advisory Panel celebrates its 100th meeting.

- include a formal mechanism for receiving and responding to questions, complaints, concerns or suggestions from the public; and
- provide the community with information about plans to modify operations, and allow for meaningful opportunities to influence those plans before they are implemented.

Finally, local representatives — nominated by the community itself — have the opportunity to serve as full participants in Responsible Care's triennial verification process, passing the ultimate judgment on whether companies are meeting their Responsible Care commitments.



Shell's Scotford Alberta site.



SHELL'S SCOTFORD OPERATION LOOKS TO THE COMMUNITY FOR DIRECTION

Since 2008, **SHELL's** Scotford, Alta. facility has turned to residents to better understand their issues, and to learn what Shell can do to improve as a member of their community.

In 2012, Shell enlisted an independent research firm to conduct its third biennial **community survey**. This comprehensive survey involved more than 300 randomly selected individuals in the communities surrounding Shell's Scotford operation (located 40 km northeast of Edmonton, Alta.), and collected their views and perceptions of Shell as a Responsible Care® operator. Survey topics included:

- ensuring employee and community safety;
- minimizing noise, odour, and flaring from plant operations;
- protecting the environment;
- providing jobs and business opportunities for the local community;
- providing leadership, support, volunteers, and financial contributions to the local community;
- being responsive to concerns and questions, and being accessible to local residents; and
- being a good neighbour.

The results of this survey will help Shell to better understand the issues facing the communities around its Scotford operation, and what initiatives it should pursue to retain its status as a Responsible Care operator, and a responsible neighbour.

Information and Acknowledgments

For company-specific emissions data, and a list of our company contacts, please visit the Chemistry Industry Association of Canada's website at www.canadianchemistry.ca.

CIAC would like to express its gratitude to Environment Canada's National Pollutant Release Inventory (NPRI) division for its support in data-gathering through the Single Window Information Manager (SWIM).

CIAC Member-Companies

Akzo Nobel Chemicals Ltd.
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Arkema Canada Inc.
Ashland Canada Corp.
Axiall Canada Inc.
BASF Canada
BioAmber Inc.
Canexus Corporation
CCC
Chemtrade
Chemtura Canada Co./Cie
Cytec Canada Inc.
Dow Chemical Canada ULC
E.I. du Pont Canada Company
ERCO Worldwide
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Evonik Oil Additives Canada Inc
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National Silicates
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NOVA Chemicals Corporation
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