Do we really need petroleum fuels? Why can’t we move away from oil faster? Canada is home to some of the world’s largest crude oil reserves. Why aren’t we refining all of it right here in Canada?
The voice of Canada’s transportation fuels industry

The Canadian Fuels Association represents the industry that produces, distributes and markets petroleum products in Canada—including 95 percent of the transportation fuels Canadians rely on to remain mobile and globally competitive. The fuels sector contributes $2.5 billion to Canada’s GDP each year and employs nearly 100,000 Canadians at 18 refineries, 21 primary fuel distribution terminals and 12,000 retail service stations throughout Canada.
Message from the Chair and President

Kicking off an authentic conversation

One year ago, our membership took on a new name: the Canadian Fuels Association. We also committed to become more active in the public discourse on Canada’s transportation fuels future—to proactively lend our voice, experience and expertise to the ongoing fuels policy debate that is closely connected to Canadians’ essential mobility.

In 2013, we took the opportunity to expand, stimulate and focus this debate. We engaged two of Canada’s leading, independent public-policy think tanks to undertake a series of roundtables in major centres across the country. Beginning in June, the Public Policy Forum (PPF) facilitated sessions in Vancouver, Toronto and Ottawa that focused on strategies for reducing transportation greenhouse gas emissions in Canada. Beginning in October, the Macdonald-Laurier Institute (MLI) is holding roundtables across the country to explore the implications of Canada’s surging crude oil production for Canada’s petroleum refining sector. Each session brings together some 30 experts from industry, academia, numerous non-governmental organizations and all levels of government.

The purpose of these roundtables is to initiate open, impartial and probing conversations about the future of our industry and its role in fuelling our mobility—conversations that welcome a wide range of stakeholders and give them a unique opportunity to express their expert views and listen to the opinions of others. To us, conversations like these are essential to bring about the best possible fuels policies and optimally balance our country’s bold economic and environmental aspirations.

One of the best ways to spur conversation is with challenging questions—hence the title of this annual review. By Tough Questions, we mean penetrating questions that call for openness and authenticity. Questions that sharpen our sense of value and direction. Questions that force a novel perspective, help us look beyond ourselves and examine critical issues with fresh eyes. That’s where solutions come from.

We believe this process of deep self-examination is vital for any industry, especially one as fundamental to Canada’s prosperity as ours. Our members share the responsibility to keep Canada mobile and competitive, and to do so while reducing the environmental impacts of petroleum fuel production and use. In 2012, our industry supplied 95 percent of Canada’s transportation fuels. It produced 89 billion litres of fuel—a daily average of 245 million litres, and a 4.6 percent increase over 2011. Gasoline production was 40 billion litres; diesel production 30 billion litres. It’s a measure of our leadership that, despite the increase in production in 2012, we continued to reduce overall refinery air emissions and water consumption, and improve refinery safety performance.

We don’t claim to have all the answers. That’s why we underwrote nationwide roundtable sessions.¹ That’s why we have posed hard questions and offered considered responses in this annual review. The questions deserve meaningful consideration by all Canadians, not just the companies who produce, distribute and market transportation fuels and other petroleum products in Canada.

We hope you will join the conversation about securing a dependable, convenient, sustainable and competitively priced fuel supply for tomorrow by asking questions and putting forward answers of your own. We welcome your views at President@canadianfuels.ca.

Helen Theoret  
Chair, Canadian Fuels Association and General Manager, Supply and Distribution, Shell Canada Limited

Peter Boag  
President, Canadian Fuels Association

¹ You can access roundtable summary reports at canadianfuels.ca/index_e.php?p=28
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TOUGH QUESTIONS
QUESTION #1

Do we really need petroleum fuels?
As petroleum fuels are clearly integral to our way of life, this may seem like an odd question. We ask it because public policy debates sometimes leave us wondering if all Canadians appreciate the vital role that petroleum fuels play in Canada’s economy and standard of living. Fuels policy is a growing focus of governments, and we want to encourage informed decision-making by spurring debate on the core issues. Here are the points we find most relevant in the ongoing discussion about the importance of petroleum fuels.

**Canada is a country on the move**

While Canadians are not alone in their need to be mobile, we are among the highest per-capita consumers of transportation fuels in the world. This should be no great surprise, given our relatively small population, enormous landmass and the importance of trade to our economy.

Consider these statistics: Canada has 900,000 kilometres of roads, on which we travel roughly 735 billion passenger-kilometres per year. That translates to more than 2 billion kilometres every day. Our civil aviation industry makes nearly 1.2 million flights per year. Our railways transport close to 4.4 million people and move 375 billion revenue tonne-kilometres of freight annually. Moving consumer and industrial goods to and from the U.S. requires one truck to cross the border every two seconds for a daily average of $2 billion worth of goods. Canadians buy roughly 110 million litres of gasoline and nearly 50 million litres of diesel every day to fuel the ships, trains, planes, trucks and automobiles that move us around.

These numbers only hint at the total transportation required to get people and goods from point A to point B and maintain Canada's economy and high standard of living.

**Fuels play a vital role**

Maintaining Canada’s economic growth and standard of living are essential reasons for making sure that Canadians have a safe, reliable and plentiful supply of petroleum fuels today and into the future. While our members also work to develop fuels that contain alternatives to petroleum, the Canadian Fuels Association is aware of our responsibility to protect Canada’s mobility (and economy) by continuing to refine, distribute and sell petroleum fuels in the most efficient manner possible. To date, no other fuel has been able to deliver the same combination of performance, convenience, reliability, safety and affordability as provided by petroleum fuels.

*The sector is also an inextricable component of the Canadian way of life. Canada is a geographically large, climatically cold country. We are a major trading and exporting nation. All these factors make transportation essential in our country.*

— PPF Vancouver Roundtable Report

We believe that Canada’s profound reliance on transportation fuels emphasizes the need for an effective national approach and thoughtful, considered policy and regulatory choices. While we acknowledge the need to move toward the development of fuel alternatives (see our in-depth discussion on this topic starting on page 9), we also want Canadians and policy-makers to be aware of the hard facts. In our vision, governments and industry work together, building on shared interests, to create the energy strategy that is best for Canada.
QUESTION #2
Why can’t we move away from oil faster?
Markets have made petroleum fuels the first choice for transportation

Petroleum fuels are energy-dense, meaning they store large amounts of energy in relatively small volumes, which makes them ideal for mobile use. They are safe, reliable products that deliver on an ever more demanding set of expectations for engine, vehicle and environmental performance. They are supported by an extensive production and distribution infrastructure—the result of billions of dollars in investment over decades that ensures Canadians have access to the fuels they need.

Our near total reliance on petroleum fuels is declining. The shift has been underway for more than a decade. Biofuels, natural gas, electricity and other alternatives all contribute to an increasingly diverse transportation fuels mix driven largely by the growing imperative to reduce transportation greenhouse gas (GHG) emissions.

The future fuel mix will be even more diverse than it is today. The essence of the question posed here is the pace of diversification. How fast (and to what degree) can we reduce our reliance on petroleum fuels without impairing the essential mobility that underpins our economy and standard of living?

The way forward to a lower carbon-intensive future is most likely to come in the form of a gradual transition; with the evolution of new advancements in technologies and fuels, supported by public policies necessary to change public behaviours, particularly as they relate to the way we move people and goods around our country.

– PPF Roundtable Background Brief

This question of pace was a central theme in the Public Policy Forum (PPF) roundtables we sponsored in June and September 2013. The roundtable discussions examined the complexities, challenges and opportunities for transportation GHG reductions in three closely related areas: fuel alternatives, vehicle technologies, and the infrastructures necessary to develop and support new fuel and vehicle types and reduce transport demand.
Biofuel use is growing but faces challenges

Biofuels are already a small but growing segment of the Canadian transportation fuels market, largely driven by provincial and now federal mandates. Biofuels have lower emission profiles than petroleum, but also lower energy density—meaning a vehicle travels further on a litre of gasoline than on a litre of biofuel. To function with current vehicle technologies, biofuels must be blended with petroleum fuels. Ethanol blends are generally limited to a maximum 10 percent of gasoline, although flex fuel vehicles can accommodate blends of up to 85 percent. Biodiesel blends face unique seasonal challenges in Canada’s cool climate that generally limit the overall annual blend ratio to approximately 2 percent of finished product. Second generation renewable diesels provide more blending flexibility.

Notwithstanding biofuels’ progress to date, a recent U.S. study suggests advanced biofuels face technological and economic challenges, as well as uncertainty about their GHG benefits.3

Natural gas—an attractive niche solution in need of infrastructure

Natural gas is a reasonable fleet solution right now for heavy-duty trucking, as well as buses, taxis, delivery and emergency vehicles that can access central refuelling facilities. Compressed natural gas and liquefied natural gas deliver better environmental performance compared to traditional petroleum-fuelled internal combustion engines, including lower emissions of GHGs and smog-causing precursors. The challenge for the broader application of this fuel is the high initial cost of natural gas powered vehicles and the lack of established refuelling infrastructure.

As a result, natural gas will likely remain a niche fuel for the foreseeable future.

Technology, with unpredictable breakthroughs and obstacles, will always be a wildcard in terms of impact on the pace of change.

– PPF Vancouver Roundtable Report

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Electricity—a longer-term prospect

Electricity has been a public transit energy source for decades, powering subways, streetcars and light rail—anything that can be tied directly to the electricity grid. But for off-grid, light-duty vehicles, technological and commercialization challenges are proving formidable. In 2012, Toyota abandoned plans to mass-produce electric vehicles, saying it had “misread the market and the ability of still-emerging battery technology to meet consumer demands.”

Battery performance is the main technological challenge, with vehicle cost proving a significant impediment for consumers, as electric vehicles are priced nearly twice that of equivalent conventional vehicles. Vehicle cost is falling, and battery efficiency is rising, but overall advancements in electric vehicle technology and market penetration have been slower than predicted. The almost complete absence of an effective and efficient battery-charging infrastructure remains a major obstacle considering the relatively short range of these vehicles. The long-term success and wide adoption of electric vehicles will occur only when consumers are assured that electric vehicles can meet their performance expectations at comparable cost, and that they can easily and affordably charge their vehicles anywhere they may take them. That degree of technology commercialization and infrastructure deployment is still a long way off.

Hybrid electric vehicles are an exception, as they do not depend on power from the grid. Onboard internal combustion engines charge the batteries and provide alternative power, helping these vehicles achieve emission levels that are 30 to 35 percent lower than conventional vehicles.

Change that’s decades in the making

Yet even hybrids face a tough road, despite being a relatively mature technology. Notwithstanding the individual success of the Toyota Prius, hybrids made up only 2.1 percent of the 12.7 million cars sold last year in the U.S.

After 14 years on the market in Canada, hybrids accounted for less than 1 percent of the 1.6 million vehicles sold in 2012. Those figures are bound to rise, but even leading hybrid proponents believe a major shift to electric vehicle technology will take 20 to 40 years.

That’s a reasonable prediction for the development and deployment of many alternative fuels, vehicle technologies and related infrastructures. And it emphasizes the vital role petroleum-based fuels will continue to play while alternatives strive for commercial viability and consumer acceptance.

To see a switch to alternatives, demand for these new fuels will have to be substantial, and price, rather than carbon emissions, will likely be the determinant of most consumer choice in the matter.

– PPF Vancouver Roundtable Report

4 www.reuters.com/article/2012/09/24/us-toyota-electric-idUSBRE88N0CT20120924
6 www2.canada.com/ottawacitizen/news/bustech/story.html?id=3bba923b-d7bb-4b7a7-908e-9762a81a55cf
The United States Energy Information Administration predicts 86 percent of total U.S. transportation will rely on liquid petroleum-based fuels in 2040.\textsuperscript{7} This is an opinion shared by the U.S. National Petroleum Council, which stated in its 2012 Future Transportation Fuels study that liquid fuel blends and internal combustion engine technologies will continue to play a significant role for decades to come.\textsuperscript{8} In North America, gasoline demand is expected to decrease, as light-duty vehicles become more fuel efficient. Diesel demand will increase, driven by growth in commercial transportation.\textsuperscript{9}

![Transportation Fuel Mix](image)

**Transportation Fuel Mix**


**Vehicles emit less when they consume less**

The International Energy Agency believes that more efficient use of our current fuels is potentially the most economical path to reduce the environmental impacts of transportation, including GHG emissions.

The Boston Consulting Group concurs. BCG reports that conventional technology still has significant potential to reduce emissions: “Advanced combustion technologies alone could reduce tailpipe emissions of carbon dioxide by approximately 40 percent from current average levels...”\textsuperscript{10}

This point was also reinforced in the PPF Toronto roundtable, where participants agreed that conventional vehicle technology in areas such as engine and transmission design, and new light-weight materials, will make a greater contribution to GHG emissions reduction than previously thought, and at modest cost. These technologies will be instrumental in achieving emissions reductions

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\textsuperscript{8} www.npc.org/reports/FTF-report-080112/FTF-Executive_Summary.pdf

\textsuperscript{9} The Outlook for Energy: A View to 2040, Exxon Mobil, 2013.

\textsuperscript{10} Powering Autos to 2020—The Era of the Electric Car?, Boston Consulting Group, July 2011.
mandated by new Canadian and U.S. regulations for vehicles in the 2017 to 2025 model years—regulations that aim to cut fuel consumption and GHG emissions by 50 percent compared to 2008 models. These regulations represent the most significant federal actions ever taken to improve fuel economy and reduce vehicle GHG emissions. New technologies, mostly hybrids, will play a growing role beyond 2020.

 Consumers continue to choose petroleum fuels

Current and proposed vehicle regulations target auto manufacturers, yet discussion at the Toronto PPF roundtable underscored the central role consumers will play in bringing about change. When it comes to alternative fuels, consumer preference has yet to be swayed. Consumers have hesitated to move to alternatives partially due to a preference for a familiar and reliable solution—petroleum-based fuels. But consumers also believe alternatives are not yet fully ready to meet the demands of the market. As Canadians, we understand their development is evolutionary, not revolutionary. Alternative fuels will eventually contribute to a more diverse transportation fuel mix; however, asking too much of them too soon risks undermining their considerable potential. Policy approaches to shape consumer behaviour and achieve gains in fuel economy and reductions in GHG emissions must be in lockstep with the ability of alternative fuels to meet expectations and inspire confidence.

GLOBAL TRENDS MATTER

The pace of movement away from oil is subject to market forces far greater than those in Canada. After all, the market for transportation fuels is global. It exerts considerable influence on our choices now. What will that influence be in coming decades? ExxonMobil predicts that expanding economies and international trade will increase global transportation energy demand by more than 40 percent by 2040. The fastest growth will occur in Asia Pacific, where transport energy demand will grow by 65 percent. Commercial transport will drive almost all of that demand growth.

While the global personal vehicle fleet doubles by 2040, energy demand from this segment grows very little as consumers turn to smaller, lighter vehicles, and various technologies improve fuel efficiency. Oil will remain the dominant fuel source, with diesel accounting for 70 percent of transportation fuel demand growth, driven by the strong growth in commercial transportation, especially heavy-duty transportation. Conventional gasoline and diesel engine vehicles will make up a smaller share of the fleet over time—approximately 50 percent by 2040. Overall, this is not to say that fuel choice will be out of our hands in Canada; rather, that progress will be influenced by worldwide trends.

QUESTION #3

Canada is home to some of the world’s largest crude oil reserves. Why aren’t we refining all of it right here in Canada?
MARKET DRIVEN. GLOBALLY STRONG.

Canada's growing prosperity over the past century and a half can be credited in part to the emergence of oil as an energy source. Today, our very way of life is inextricably linked to this valuable natural resource and the essential products we make from it. We are proud of our oil heritage and feel an intense responsibility to manage and make the wisest use of the resource. We've chosen to meet that responsibility in a market-driven economy. This market, however, is not local, provincial or national. It is concurrently continental (part of an integrated North American free market) and global. Decisions about trade and investment must be made with these immense and highly dynamic markets in mind.

There are three principal reasons why we don’t refine all our growing domestic crude supply in Canada. First, we already refine more than enough to meet all domestic needs; in fact, we are a net exporter of refined products. Second, most of our refineries aren’t configured to process bitumen from the oil sands. Third, the investment case for building new bitumen-capable refineries is challenging.

It comes down to refinery economics

Canada is blessed with a sizeable crude oil resource endowment. Our reserves rank third largest in the world after Venezuela and Saudi Arabia, and we are the single largest crude oil supplier to the U.S. Surging oil sands production is expected to double Canada’s crude oil output between now and 2030.12

Canada's refining industry is an integral component of the oil and gas value chain, the crucial manufacturing step between crude oil and refined products such as gasoline and diesel. To most Canadians, all refineries appear to be the same. In reality, each refinery is a unique and complex industrial facility with limited flexibility in the crude oils it can process and the mix of products it can refine.

Refinery profitability is determined by a complex set of variables including refinery size and configuration, the type of crude processed, the product outputs, energy and labour costs, location and transportation infrastructure, regulatory constraints and compliance costs. Refiners strive to optimize these variables in an environment that is increasingly dynamic and rife with varying levels of commercial, technical, economic and regulatory risks.

12 Crude Oil Forecast, Markets & Transportation, Canadian Association of Petroleum Producers, June 2013.
Demand patterns are changing, markets are shifting

Two primary factors combine to introduce new dynamics to the economics of refining and shift the drivers of refinery profitability. One is the change in fuel demand patterns and the rising global trade in refined products. The second is the growing trend to process heavier crude oils, which demand increased refinery complexity.

Demand for refined petroleum products is flat to declining in North America and in virtually all developed nations. Demographics, new vehicle emission regulations and growing use of alternative fuels are gradually reducing our consumption of petroleum fuels. The resulting refining overcapacity and low margins in the Atlantic Basin have led to recent refinery closures in eastern Canada, the U.S. eastern seaboard, Europe and the Caribbean. Meanwhile, one million barrels per day of new heavy crude refining capacity has been added along the U.S. Gulf Coast, and millions more is available or under construction in Asia, where fuel demand is on the rise, driven by growing economies and higher living standards.

These new fuel demand patterns mean that growing the Canadian refining business in tandem with greater crude production would require us to profitably export finished fuels to new markets, in particular those in Asia. Canada’s oil industry always has its sights on new markets, but the challenges in Asia are formidable. While demand is growing in the region, so is its refinery capacity. Some observers believe that China is overbuilding to the degree that it will soon emerge as a major refined product exporter.13

Canadian refineries are small by international standards and don’t enjoy the same economies of scale as established competitors in the U.S. and emerging competitors in Asia. Our proximity to the large U.S. market has made it possible for the Canadian refining sector to profitably supply U.S. demand, especially along the eastern seaboard. With few exceptions, however, Canadian refineries lack the capability to process the heavy crude oils and Canadian bitumen that have grown in recent years as a proportion of world crude supply. These refineries were built to process lighter crude oils and supply local demand at a time when proximity to market was a key determinant of refinery profitability. Many of these refineries are in a tough fight to remain competitive and economically viable in their traditional markets.14,15

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It’s a capital-intensive industry

Nearly all the new refinery capacity built in the world since 2003 comprises large, highly complex facilities that can process heavy crude. Penetrating potential new markets to capitalize on our growing bitumen production would require construction of similar types of refineries in Canada.

A BUBBLE BURST

The so-called “bitumen bubble” emerged in 2011 when the discount for oil sands bitumen spiked to nearly $40 per barrel from the more typical $10 per barrel that reflects the quality difference between bitumen and lighter, sweeter crude. The bubble, which drove much of the discussion and debate about refining more of our oil in Canada, was the result of a combination of factors, most notably transportation bottlenecks that land-locked western Canadian oil with insufficient access to markets. By mid-2013, the increased shipment of North American crude by pipeline, rail and even barge had returned the differential to near normal, although it has recently widened again. This episode amply demonstrates the volatility of oil markets and emphasizes the importance refiners place in long-term business and investment perspectives.

Refining is a capital-intensive business. The cost to build a new high complexity refinery would range from $10 billion to $15 billion. Even a modest expansion or configuration change to refine heavy crudes and bitumen would cost approximately $3 billion and there is excess capacity available in the U.S. Winter weather conditions and higher labour costs are two key factors that can double Canadian construction and operating costs compared to those in the U.S. Gulf Coast or Asia.16

Any decision to invest in new Canadian refinery capacity must pass a number of critical hurdles to show the likelihood of achieving an adequate return on investment. Volatile refinery operating margins, influenced by global, regional and local factors create an unpredictable investment environment. The bottom-line question for prospective investors is whether new Canadian refinery capacity can profitably access and penetrate new markets. Can the complex variables of crude diet, refinery configuration, product slate, logistics and transportation, and regulatory regime be harnessed with adequate certainty to overcome or sufficiently mitigate the commercial, technical, regulatory and economic risks? The stakes are high when the payback period is 20 to 30 years or more.

16 Extracting Economic Value from the Canadian Oil Sands, IHS CERA, 2013.

EAST-BOUND CRUDE — DISPLACING IMPORTS WITH DOMESTIC SUPPLY

Only 60 percent of the crude processed by Canadian refineries is sourced from domestic production, since refineries in eastern Canada have limited access to western Canadian crude supplies. Proposed pipeline projects, such as Enbridge’s Line 9 reversal and TransCanada’s Energy East project, would enable greater access to Canadian crude for eastern Canadian refineries. Although these refineries are generally configured to process light crude oil, most of which they import, enhanced access to western Canadian crude would provide eastern Canadian refineries with additional options to select crude feedstocks based on availability, quality and cost.
The risk of unintended consequences

Beyond these commercial and economic risks, investors face another variable: the regulatory environment. In a global market, differing regulatory regimes can tip the balance in favour of one producer over another. A refiner operating in a country with lower environmental, health and safety regulations may gain a marginal cost advantage over a Canadian facility if it chooses to operate below the standards we hold to be compulsory in Canada.

A 2012 study of the impact of anticipated new Canadian regulatory initiatives on refineries indicates that facilities in competing jurisdictions incur different costs if they are not held to the same regulatory standard.17 Higher compliance requirements can threaten the economic viability of refineries and erode the investment environment. A successful Canadian refining industry depends on a public policy agenda that is harmonized with competing jurisdictions. It depends on policy choices validated by rigorous economic, environmental and social analyses that demonstrate net benefits for Canadians. It depends on regulatory instruments that give refiners flexible, cost-effective options for achieving compliance.

A prosperous Canadian refining industry depends on a public policy agenda that is harmonized with competing jurisdictions.

Where is the best value?

The question of why aren’t we refining more of our oil in Canada is often driven by the belief that exporting crude without processing it into finished products foregoes the opportunity to add significant value. The assumption is that the value from manufacturing is greater than that from resource extraction, and that later stages of processing create better terms of trade than resource production.

This commonly held belief is not supported by economic analysis. Statistics Canada data show that for extraction, and the services that support it, the value-added proportion of gross output is much higher than for refining. In absolute terms, refining creates immense value; however, in relation to all activities in the value chain, refining’s value-added proportion is the lowest. This pattern is consistent with many other manufacturing sectors. Smartphone production is a good example. Manufacturing in that sector is a lower value-added activity than design and engineering—part of the reason why manufacturing is offshored to Asia, where labour costs are more competitive.

Balanced investments make for a viable future

The conclusion is not that we should ignore refining. Resource extraction versus refining needn’t be an either-or choice. It makes good economic sense to balance investments and activity at the front and back ends of production.

Canada is home to many efficient, competitive and profitable refineries that contribute significantly to our economy. A number of refineries have closed since 1970, but the industry has also invested more than $40 billion in that period to upgrade and expand other facilities, maintaining our overall refining capacity at approximately 2 million barrels per day. These investments include $2.8 billion in 2012 alone.

But faced with finite capital in the current market, oil industry investments are flowing mainly to upstream oil and gas extraction activities because that is where the greatest value is found.

DIG DEEPER.

For a more in-depth economic examination of Canada’s refinery sector, download The Economics of Petroleum Refining: Understanding the business of processing crude oil into fuels and other value added products from the Canadian Fuels Association website: canadianfuels.ca.
INDUSTRY PERFORMANCE
PRODUCTION

To meet demand, Canada’s refineries operate around the clock, producing an average of 250 million litres of fuel per day. They contribute $2.5 billion in direct GDP to the Canadian economy and employ 17,500 highly skilled workers.

Data: Statistics Canada—The Supply and Disposition of Refined Petroleum Products in Canada.

Canadian gasoline production has gradually decreased during the last 10 years, while diesel production has increased.

Crude imports are decreasing as Canadian refineries process more domestic crude.

Canada is a net exporter of refined products, but our product exports are decreasing.
SAFETY

Our members operate according to the principle that if something can’t be done safely, it shouldn’t be done at all. The safety record for the 15 Canadian refineries operated by Canadian Fuels Association members is one of the best among all Canadian manufacturers.

Data: Canadian Fuels Association member companies. All safety and environmental expenditures data is for Association members only.

ENVIRONMENTAL PERFORMANCE

Canadian Fuels members have invested almost 8 billion dollars in the past 10 years to improve the environmental performance of their refineries and the fuels they produce.
**CO₂ Emissions**

Refineries produce about 2.5 percent of Canada's total GHG emissions. Since 2007, refining industry CO₂ emissions have decreased by over 17 percent, even as refining intensity has increased because of the need to produce cleaner fuels.

Data: Canadian Industrial Energy End-Use Data and Analysis Centre (CIEDAC), Simon Fraser University.

By making better use of energy and improving the efficiency of the refining process, refiners have made good progress in reducing their GHG emissions over the last decade.
Air Emissions

Canadian refiners continue to make impressive progress in reducing air pollutant emissions.

Data: Environment Canada's National Pollutant Release Inventory (NPRI). Data is for all Canadian refineries.
Water

Canadian Fuels Association members are continually working to enhance their water stewardship by using less water and by improving the quality of the water they return to the ecosystem.

Data: Canadian Fuels, 2012. Water data is for Canadian Fuels Association member refineries only.

Water intake is down nearly 14 percent since 2005.

Effluent quality is far better than required by regulation.

Surplus Site Remediation

Canadian Fuels Association members are committed to giving surplus sites a second life, making them available for new, productive uses.

Data: Canadian Fuels, 2012. Site remediation data is for Canadian Fuels Association members only.

Our members have remediated 676 surplus retail and other industrial sites since 2009, including 207 in 2012 alone.
FUEL QUALITY

Canadian regulations impose stringent limits on sulphur and benzene content in fuels. Canadian Fuels Association members consistently produce fuels with sulphur and benzene levels that are well below regulated requirements.

Data: Canadian Fuels member companies (excluding Husky Energy Inc. and NOVA Chemicals (Canada) Ltd.). Includes North Atlantic Refining data from 2004 to present. Data includes imports.

**Sulphur in Gasoline**

At any given time, the sulphur content of gasoline must not exceed 80 ppm, with an annual average content of only 30 ppm.

**Sulphur in On-road Diesel**

The maximum allowable sulphur content of diesel is 15 ppm.

**Benzene in Gasoline**

Benzene content in gasoline is limited to 1 percent of volume, or 1.5 percent by volume if the yearly pool average of all gasoline produced by a refiner does not exceed 0.95 percent of volume.
For more information, please visit our website, canadianfuels.ca

To comment, contact president@canadianfuels.ca
We’ll take you there