

Canada's Refining Industry 2017 Sector Performance Report



Canadian Fuels
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canadienne des carburants





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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.

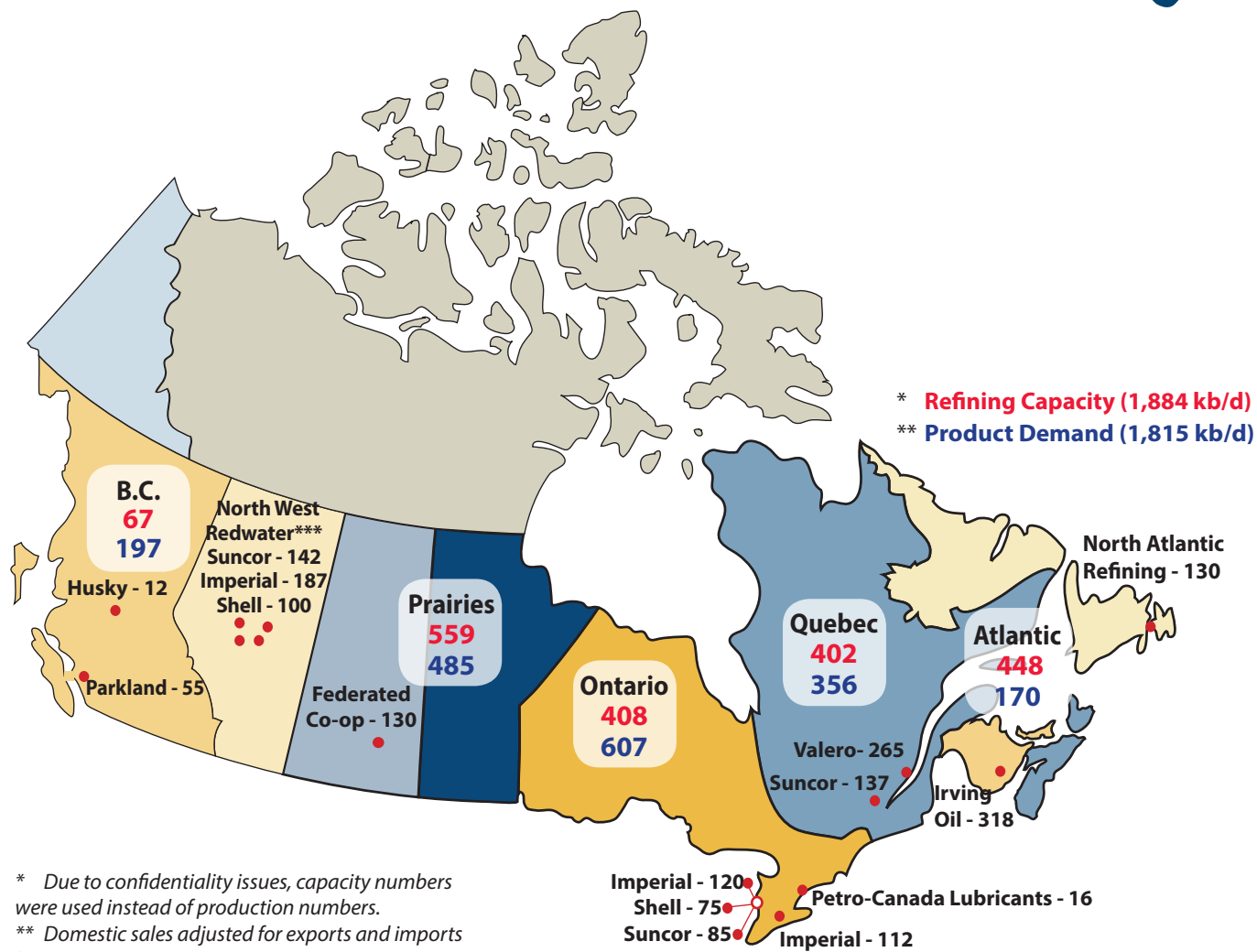
The fuels sector contributes over \$5 billion to Canada's GDP each year and employs more than 117,000 Canadians at 15 refineries, 76 fuel distribution terminals and approximately 12,000 retail and commercial sites throughout Canada.



Canada's refining sector at a glance



Source: Companies' websites, 2017
Statistics Canada, 2017



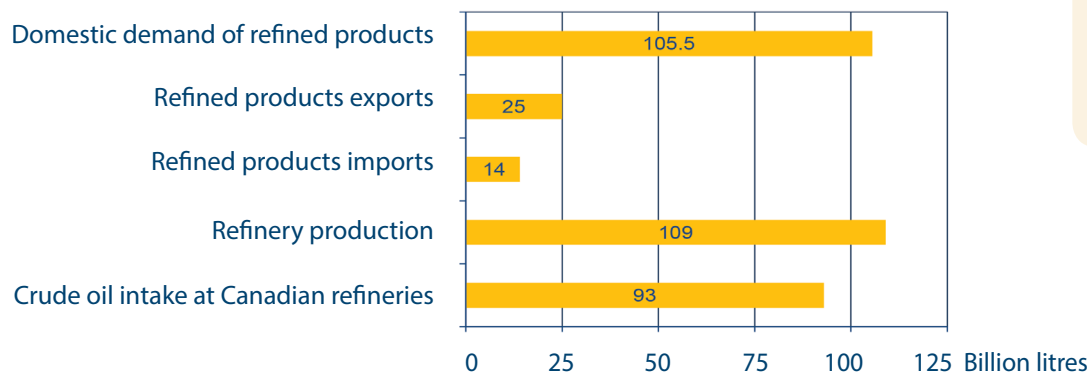
- 15 refineries located in 7 provinces
- Total refining capacity, 2016: 1,884 kb/d
- Product demand, 2016: 1,815 kb/d
- GDP contribution, 2016: \$5.4 billion
- Refinery employment, 2016: 19,057
- Refined product exports, 2016: 25.1 billion litres
- Refined product imports, 2016: 14.1 billion litres
- Total annual investments, 2016: \$1.7 billion

Production

Canadians pump over 208 million litres of gasoline and diesel into their fuel tanks every day. To meet demand and to keep Canadians on the move, the country's 15 refineries operate 24/7 to produce over 109 billion litres of road, jet, rail and marine fuels, heating oil, lubricants and petro-chemicals.



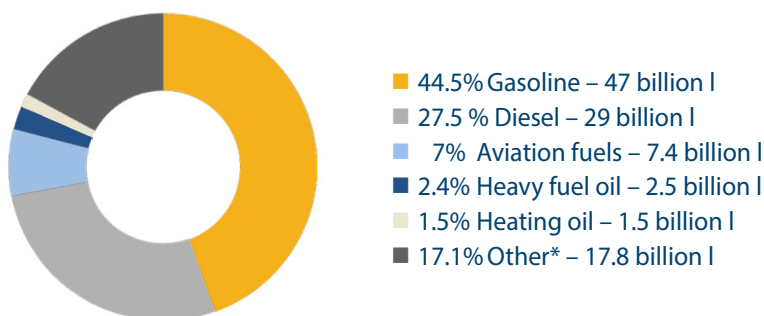
Canadian supply and demand, 2016



Data: Statistics Canada, 2017.

Canada is a net exporter of refined products – refinery capacity exceeds domestic demand, notably in Quebec and Atlantic Canada.

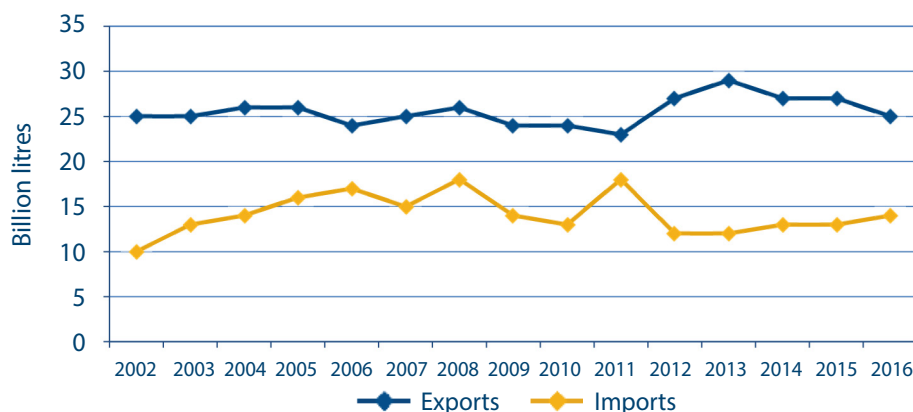
Domestic sales by product (billions of litres), 2016



An increase in freight transport is driving growth in diesel demand.

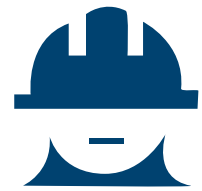
*Other includes propane, butane, petro-chemical feedstocks, lubricating oils, petroleum coke, asphalt, etc. | Data: Statistics Canada, 2017. | Numbers may not add up due to rounding.

Canadian exports and imports of refined petroleum products



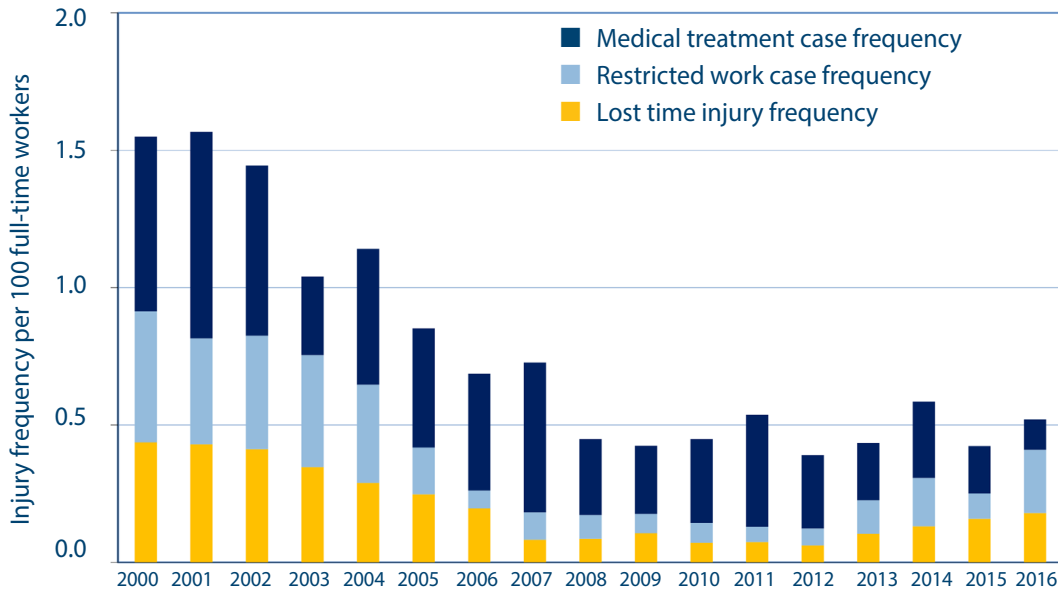
Data: Statistics Canada, 2017.

Refined petroleum products flow across both sides of the Canada – U.S. border, adjusting to demand and market conditions (see page 10 Canada/U.S. refined petroleum product trade flow).



Refinery employees – Total recordable injury frequencies

Our member companies are leaders in industrial safety management, and have among the best safety records of any manufacturing industry in Canada.



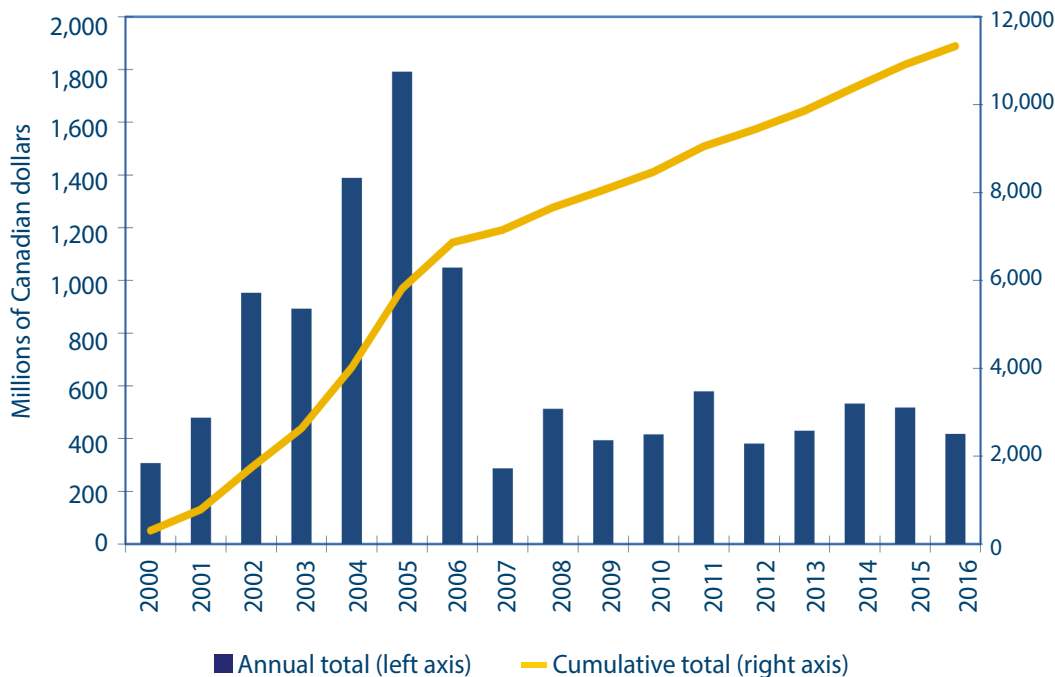
Since 2000, total recordable injuries for refinery employees have decreased by 66%. The work doesn't stop here – we believe no one should ever get hurt, on or off the site.

Canadian Fuels Association members only.



Environmental performance

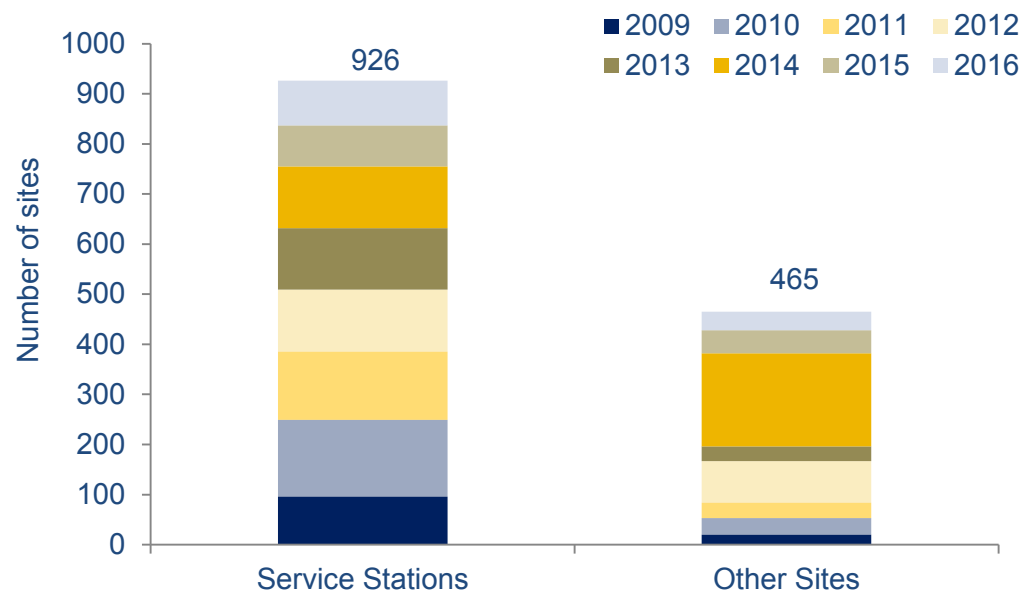
Canadian Fuels members' total environmental expenditures



Canadian Fuels members are working to get greener every year. Since 2000, our members have invested over \$11.3 billion to improve the environmental performance of their refineries and the fuels they produce, including \$5 billion to significantly reduce sulphur in gasoline and diesel.

Canadian Fuels Association members only.

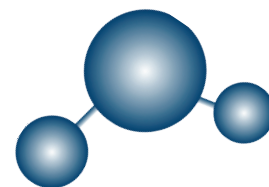
Surplus site remediation



Canadian Fuels and its members work closely with communities to help give surplus sites a second life. Since 2009, our members have remediated 1391 surplus sites, making them available for industrial, recreational, residential, or commercial use.

Canadian Fuels Association members only.

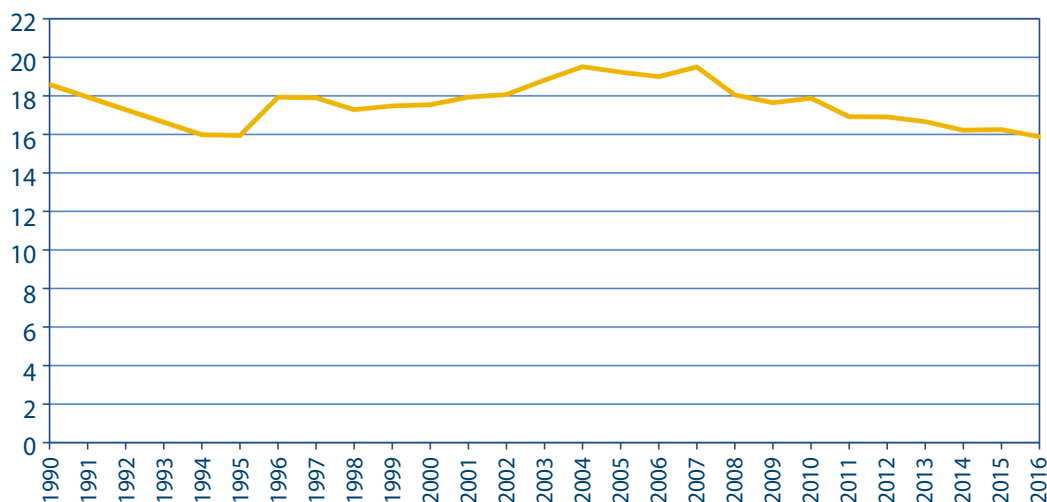
Greenhouse gas emissions



Total CO₂ emissions, Canadian refining industry

Canadians, as well as governments at all levels, are increasingly concerned by the challenge of mitigating climate change. Canada's refiners account for 2% of the country's total GHG emissions and are committed to doing their part to reduce them.

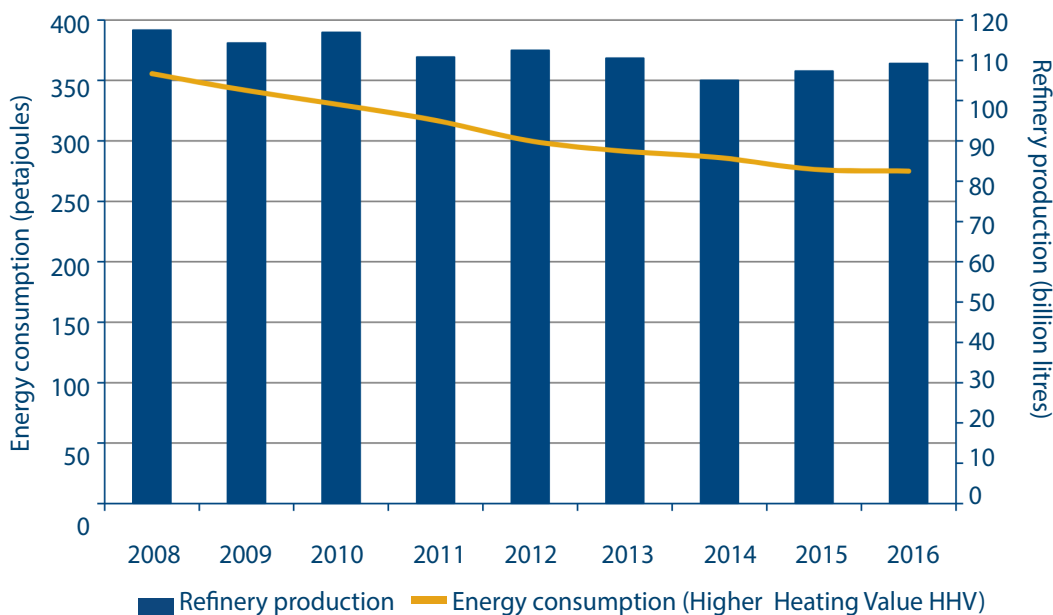
CO₂ (Megatonnes)



Source: Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC), Simon Fraser University, 2017.

Our sector's carbon dioxide (CO₂) emissions have been reduced by 15% since 1990 – all while the refining process has become increasingly intensified to meet stringent fuel quality standards (see page 8).

Energy consumption of petroleum refineries



One way to reduce GHG emissions is to decrease energy use. Energy fuel consumption at Canadian refineries has decreased by 22% since 2008.

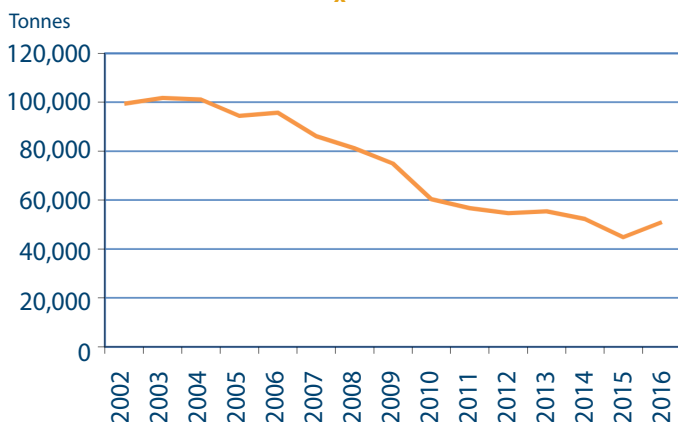
Data: Statistics Canada, 2017.

Air emissions

Canada's refining sector can help improve air quality on two fronts – decreasing emissions at refineries, and producing cleaner fuels (p. 8).

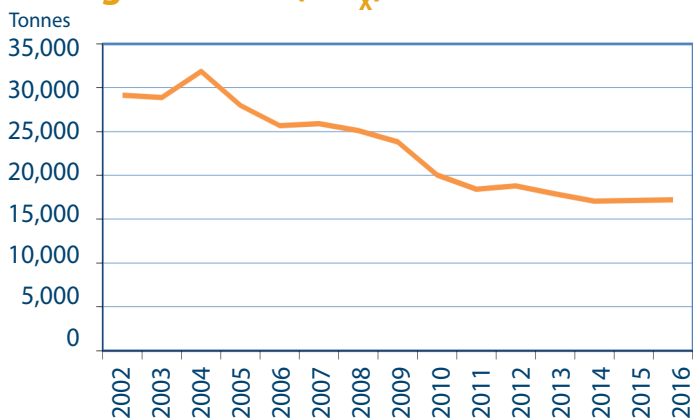


Sulphur oxides (SO_x) ▼49%

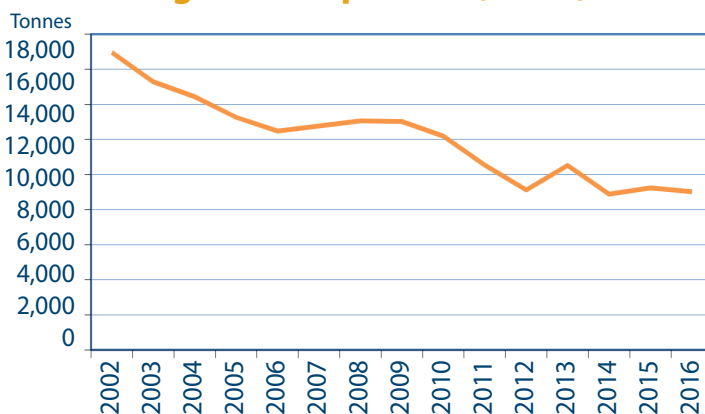


Refiners are continuously looking at ways to improve their processes – leading to significant improvements in air emissions at facilities.

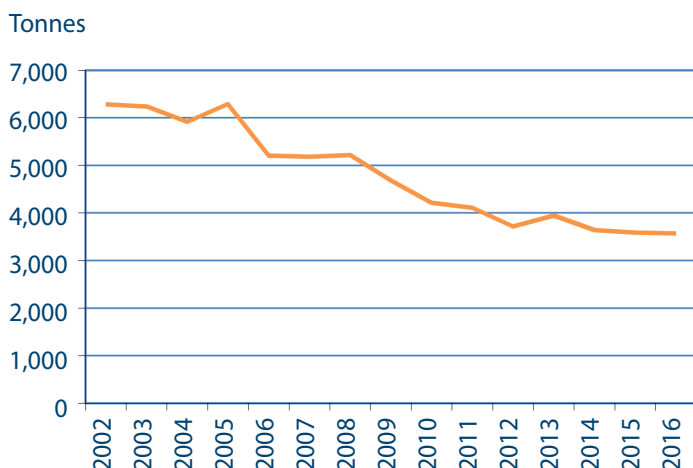
Nitrogen oxides (NO_x) ▼41%



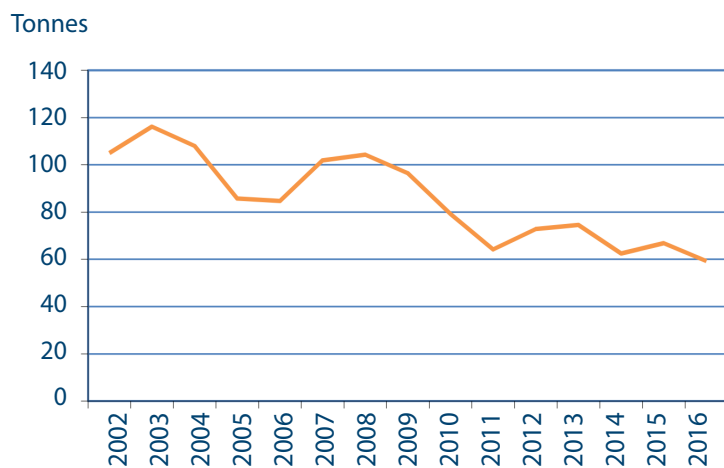
Volatile organic compounds (VOCs) ▼47%



Total particulate matter (TPM) ▼43%



Benzene (C₆H₆) ▼44%



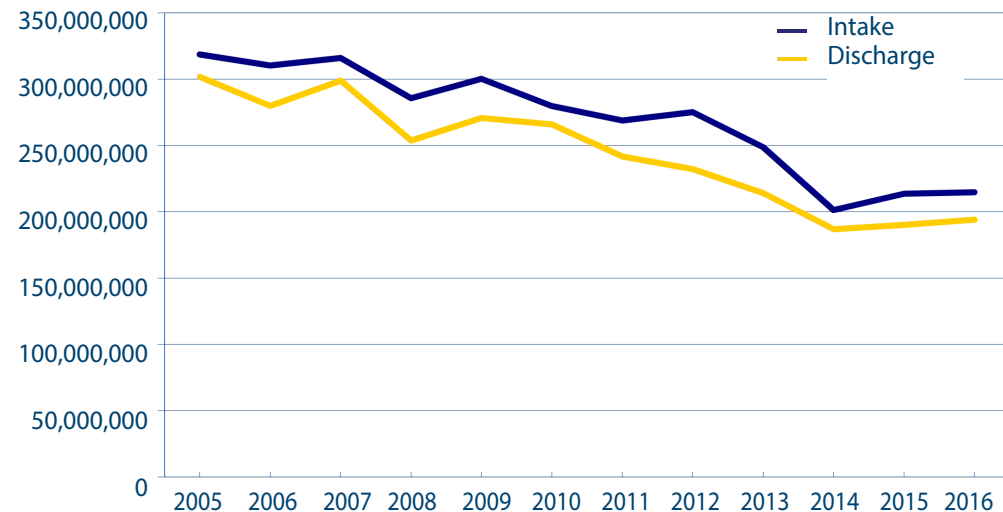
Data: Environment and Climate Change Canada National Pollutant Release Inventory (NPRI), 2017.

Water

Years of commitment to continuous improvement in how we use water has paid off: refiners need less water to process a barrel of crude oil, and water is returned to the environment in a cleaner state.

Refinery water usage

Cubic metres (m³)

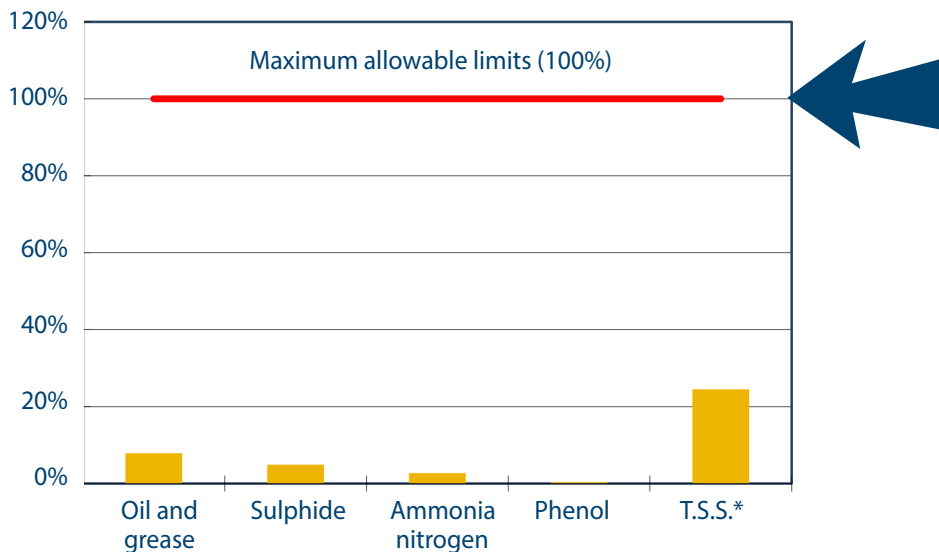


Water intake is down 33% since 2005.

Canadian Fuels Association member refineries only.

Refinery effluent quality

% of allowable limits



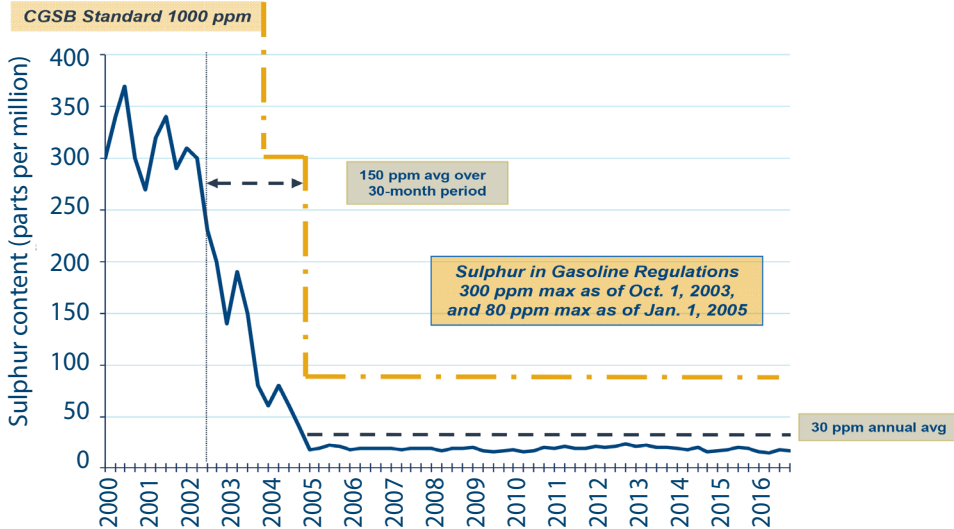
Effluent deposits from refineries are well below federal maximum allowable limits.

*Total suspended solids. | Canadian Fuels Association members only. | 2016 data.



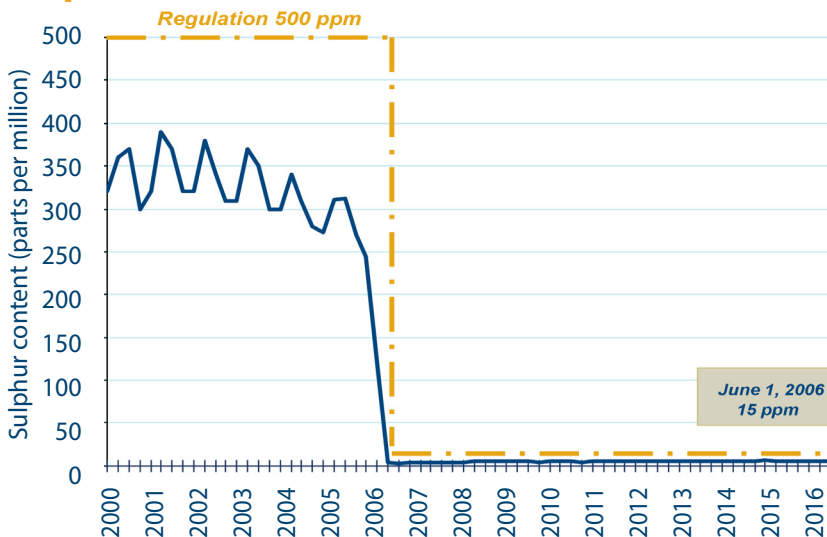
Fuel quality

Sulphur in gasoline*



Fuels have changed significantly in the past decades. Lead was entirely phased out of gasoline and benzene was cut to less than 1% of volume. Refiners have invested over \$5 billion to cut sulphur to less than 30 ppm in gasoline and less than 15 ppm in diesel. The new regulation beginning in 2017 will further reduce sulphur in gasoline to 10 ppm annual average.

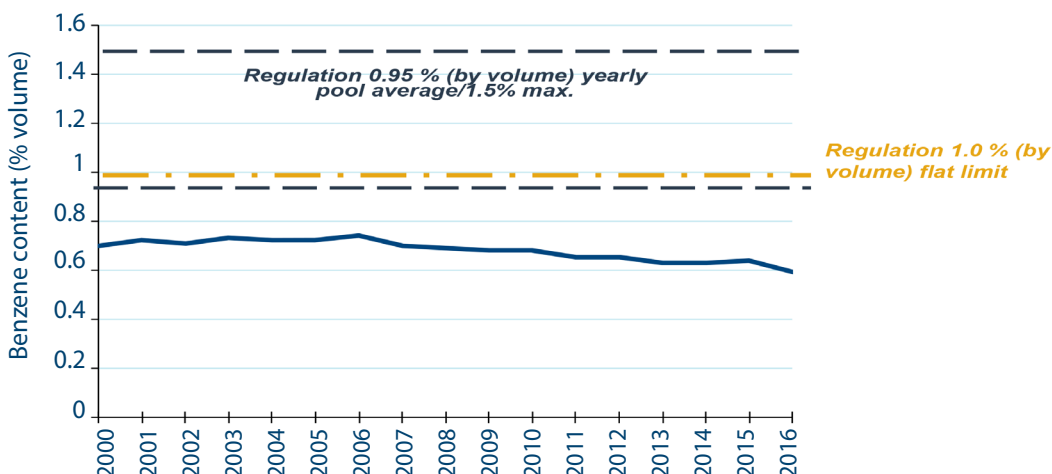
Sulphur in diesel*



Sulphur in Diesel Fuel Regulations implemented in 2006 cut sulphur in on-road diesel from 500 ppm to 15 ppm.

*Canadian Fuels Association members only. | Data includes imports. Quarterly volume-weighted averages are shown.

Benzene in gasoline



Benzene content is far below the maximum allowable.

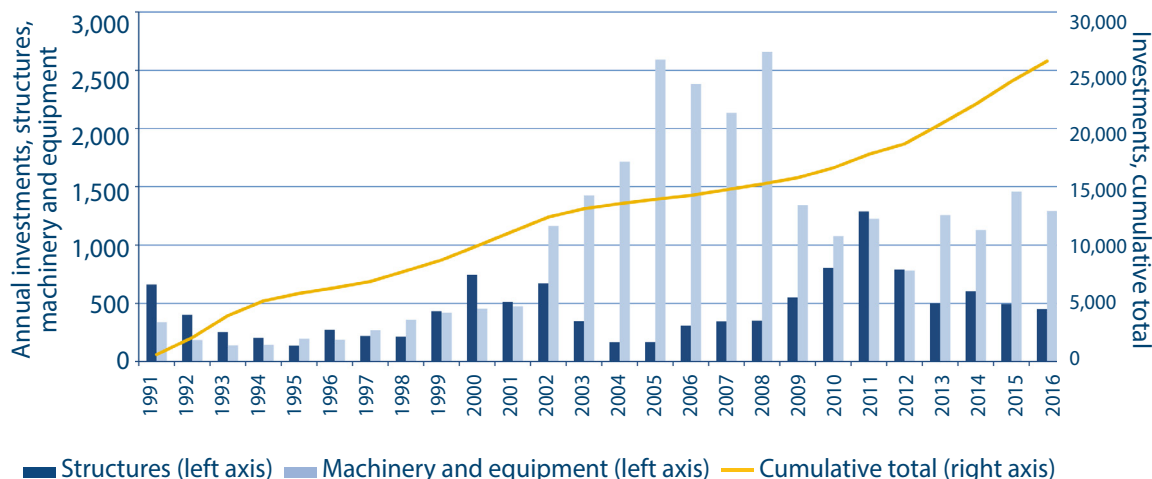
Canadian Fuels Association members only. | Data includes imports. Volume-weighted averages are shown.

Refining sector economic indicators

A competitive refining sector is a key contributor to a strong Canadian economy, adding over \$5 billion to the country's GDP each year.



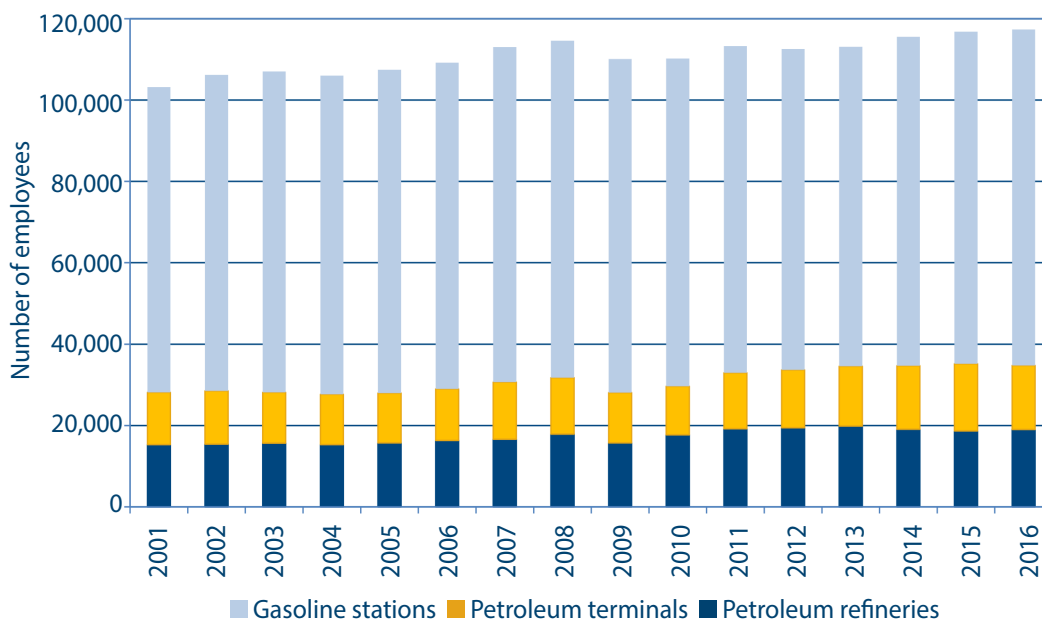
Refining sector investments (millions of Canadian dollars)



Canadian refiners have invested more than \$25 billion in structures, machinery and equipment since 1991. That's an average of \$2 billion a year in the last 10 years.

Data: Statistics Canada 2017, The Conference Board of Canada.

Downstream sector employment



Canada's fuel refining, distribution and retailing sector employs over 117,000 workers, including over 19,000 at refineries, more than 15,000 at fuel distribution terminals and over 82,000 at retail sites.

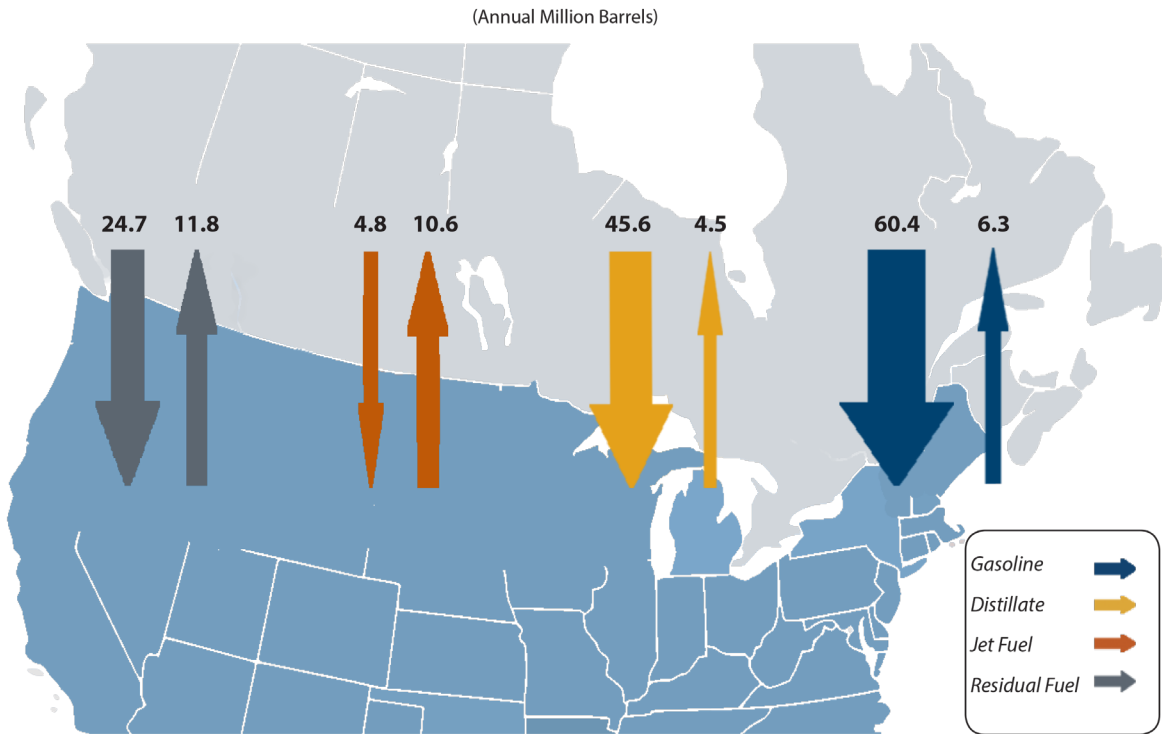
Data: Statistics Canada, 2017.

Canada-U.S. product trade flow

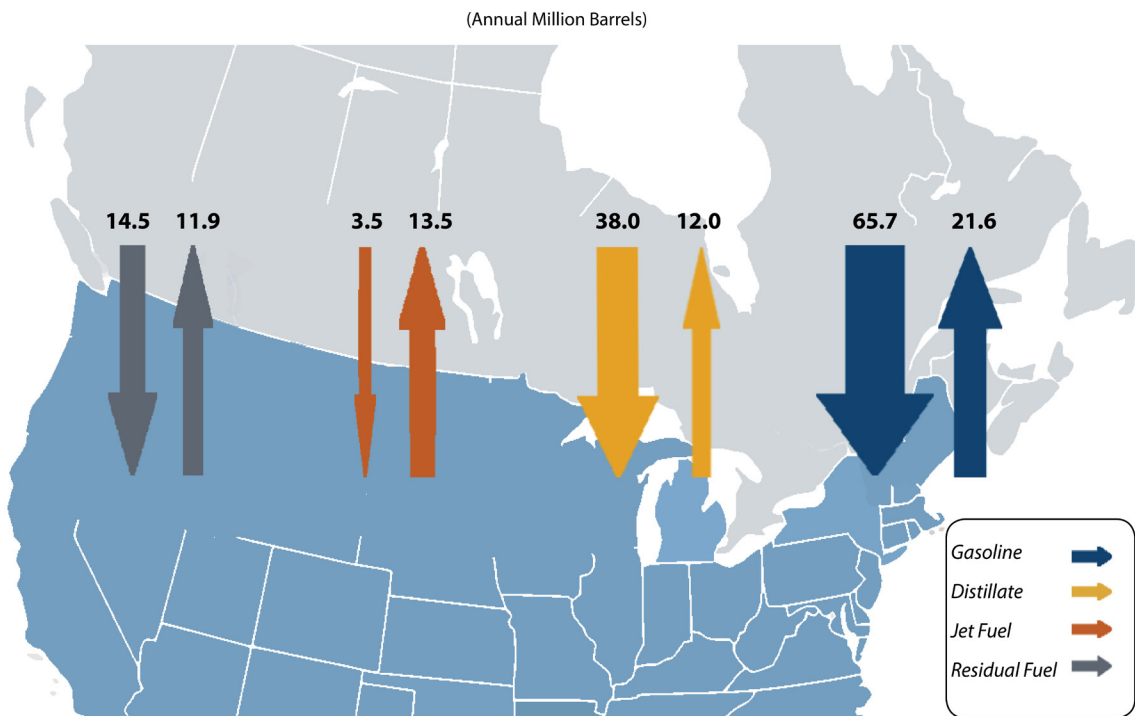


Canada and US trade includes a multi-directional flow of refined products across borders with diverse regional, seasonal and product-specific characteristics. For example, Canada is a net importer of jet fuel, but a net exporter of gasoline; the US northeast, in particular, relies heavily on gasoline imports from Canada.

Refined Petroleum Products Trade Flow between Canada and US (2007)



Refined Petroleum Products Trade Flow between Canada and US (2016)





CANADA'S REFINING SECTOR Trade and Economic Contribution



180 million barrels a year

of refined petroleum product between Canada and the U.S.
(EIA, 2017)



\$9.4 billion in trade value

from refined petroleum product export to the U.S.
(Statistics Canada, 2017)



\$5.4 billion to Canada's GDP

from the refining sector (Statistics Canada, 2017)



117,323 jobs

in the refining, distribution and sale of transportation fuels in
Canada (Statistics Canada, 2017)



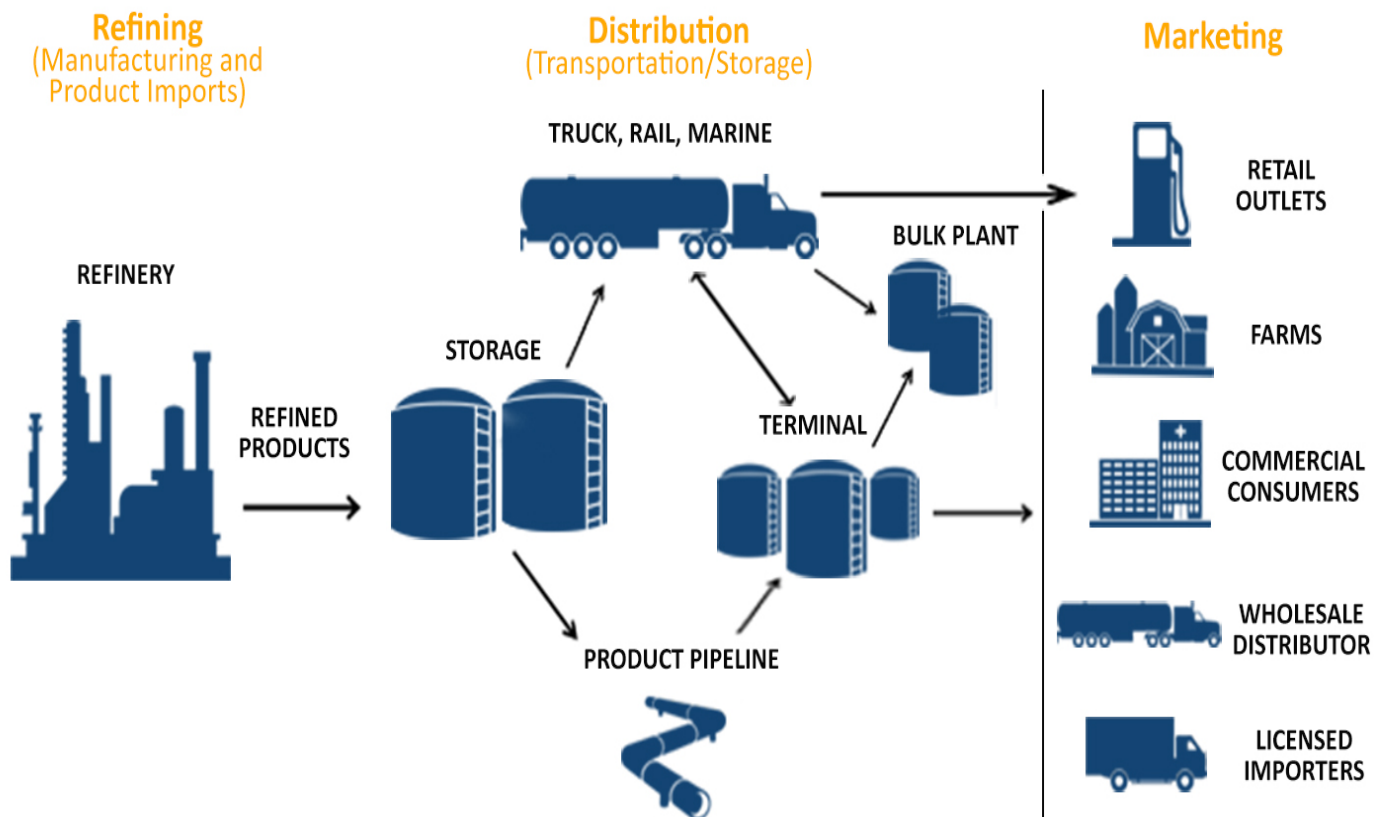
\$21 billion in tax revenue

from transportation fuel sales in Canada. (Kent Group Ltd., 2017)





Downstream Sector Refining, Distribution, Marketing





FUEL FACT



In 2016, there were 11,931 retail gasoline stations operating in Canada, or 3.3 outlets for every 10,000 persons.



FUEL FACT



Refiners make work sites safer by benchmarking safety practices and continuously developing programs that proactively identify and eliminate hazards.



FUEL FACT



2016 marked the second year in a row of gasoline station increases in Canada after a 20 percent decrease over the previous 10 years.



FUEL FACT



Since 2000, total recordable injuries for refining employees have decreased by **66** percent.



FUEL FACT



The Canadian Fuels Association's Driver Certification Program certifies around 5,000 drivers per year and is required by all drivers in Canada to safely handle fuel in various situations.



FUEL FACT



Refiners and local authorities share emergency response resources, and participate in simulated emergency scenarios as part of a coordinated emergency response program.



FUEL FACT



Only 14 per cent of gasoline stations in Canada are under price control of refiner-marketers in Canada.



FUEL FACT



Refiners have among the highest safety records of any manufacturing sector in Canada.





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Members

