



Canadian Retail Gasoline Prices Reached a Two-Year High in the Third Quarter of 2017, Pushed Higher by the effects of Hurricane Harvey.

Retail gasoline prices rose steeply in the latter part of the past quarter following the wholesale price response to constrained supply caused by Hurricane Harvey. Similarly, diesel prices responded to a wholesale price rise at a time of year that typically sees lower prices.

Before the effects of Hurricane Harvey were felt, North America was experiencing particularly strong summer gasoline demand, leading to record refinery outputs in August. This put upward pressure on wholesale gasoline prices, expanding refining margins from the previous quarter. Additionally, North American diesel production reached a record high in July as refiners responded to strong economic activity and demand for exports. Despite record production, distillate stocks decreased over the summer, and diesel margins rose in July and August, in contrast to seasonal norms.

In late-August, Hurricane Harvey made landfall on the Gulf coast, an area that is home to a number of large refineries. Ultimately, the effects of the storm knocked nearly 30 percent of U.S. refining capacity offline, which in turn partially shut down the Colonial Pipeline – the largest refined product pipeline in North America. This pipeline is the primary conduit for fuel supply into the northeastern part of the U.S. (PADD 1), and services some of North America’s most highly populated areas. Constrained supply of refined products into the region sent wholesale prices higher, and caused a ripple effect in the areas bordering PADD 1, including parts of Ontario, Quebec and Atlantic Canada. **Figures 1&2** show the historical movement of retail gasoline and diesel prices in Canada along with their component prices.

A strengthening Canadian dollar lessened the domestic effects of rising global crude prices this past quarter. Both WTI and Brent, key North American and International crude benchmarks respectively, rose over the quarter, albeit to varying degrees. WTI rose 5.64 \$US/BBL, ending the quarter at 51.67 \$US/BBL, or 12.3 percent higher than the end of the previous quarter. Brent rose 9.78 \$US/BBL, ending the quarter at 57.28 \$US/BBL, or 20.6 percent higher than the end of the previous quarter. Brent’s premium to WTI grew in third quarter, reaching as high as 7.37 \$US/BBL in late September, driven primarily by disruptions to refinery activity in the Gulf Coast, causing a buildup of North American crude, while global crude prices were supported by production target reductions abroad.

Figure 1: Canadian Average Regular Gasoline and Component Prices

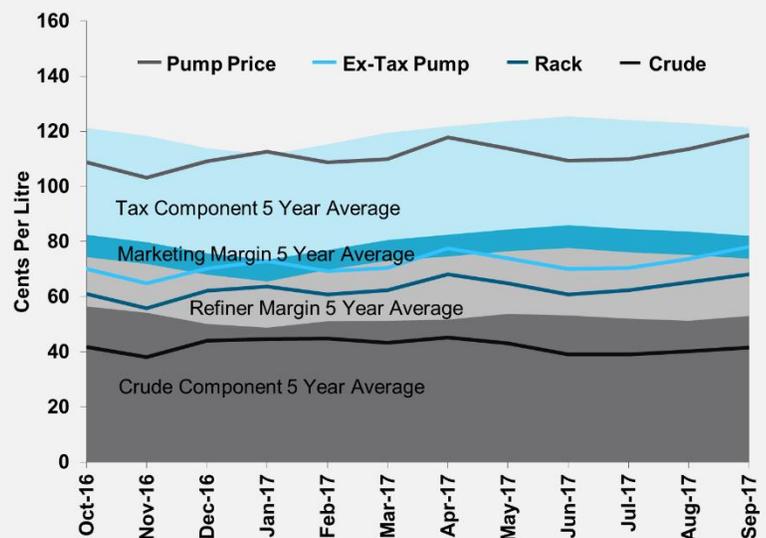
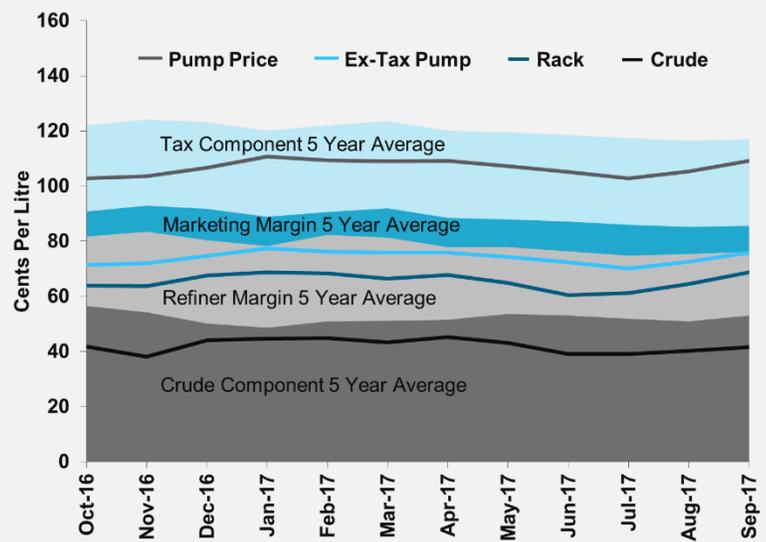


Figure 2: Canadian Average Diesel and Component Prices



Western Canadian Select (WCS), a heavy Western Canadian benchmark, ended September up 7.6 percent. The WCS discount to WTI rose in July and August, peaking in early September at 13.00 \$US/BBL following reduced refinery activity in the Gulf Coast. As refineries came back online the discount shrank, ending the quarter at 11.14 \$US/BBL, or 1.34 \$US/BBL higher than the previous quarter.

Gasoline and Diesel Market Overview

Canadian retail gasoline prices rose steadily over the past quarter following marginally higher crude costs, rising wholesale prices, and higher retail margins. A strengthening Canadian dollar somewhat mitigated the effects of rising wholesale prices, ending the quarter three to four cents per litre lower than they likely would have been without the change in the exchange rate. In September, gasoline prices reached their highest level since July 2015.

Wholesale prices rose throughout Canada this past quarter with the greatest increases in Central and Eastern regions, in response to Hurricane Harvey, while the Western region ended the quarter higher, following higher crude prices. The disparity between the highest and lowest priced regions in Canada finished the quarter at nearly 20 cents per litre.

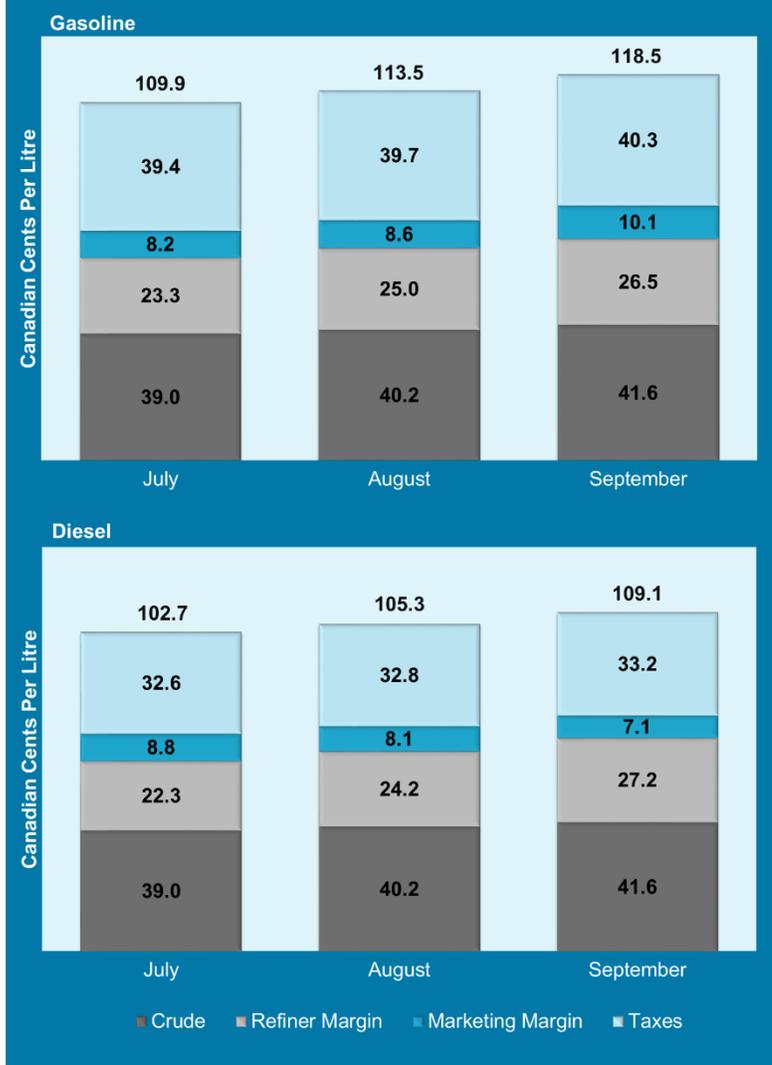
Diesel refining margins expanded to a 14-month high in September as wholesale prices were pushed higher, while retail diesel prices were slower to move, causing retail margins to shrink to a 16-month low in September. (Figure 3)

Market Outlook for the Next Quarter

Gasoline prices in the fourth quarter are likely to fall as normal seasonal demand recedes and refiners make the switch to less expensive winter fuel blends. Additionally, any effects of the hurricane season in Central and Eastern parts of the country will likely have worked themselves out by that time.

In contrast to gasoline, there will likely be upward pressure on diesel prices over the next quarter. Demand for diesel typically rises in the fall because of the link between diesel and heating fuel markets, and the effect of the fall harvest on demand. Given that distillate stocks uncharacteristically shrank this past quarter, diesel supply could be tighter than normal, meaning prices may rise more steeply. In addition, retail diesel margins are likely to return to normal historical levels over the quarter, likely putting more upward pressure on retail prices.

Figure 3: Canadian Average Gasoline and Diesel Price Components for 3rd Quarter 2017

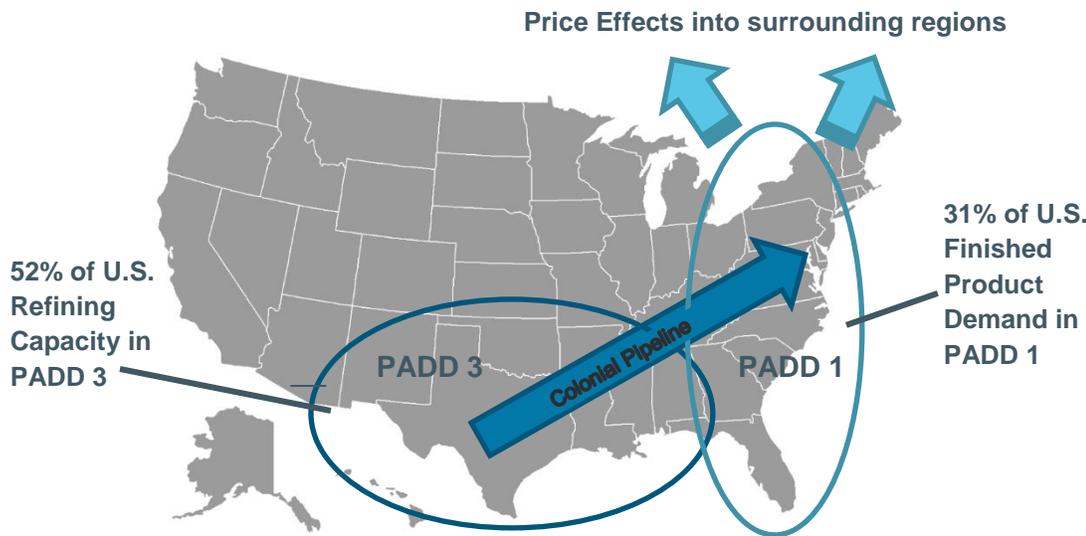


The Effects of Hurricane Harvey on Canadian Pump Prices

Hurricane Harvey struck the southern U.S. in late August, and despite being several-thousand kilometres away, it caused a distinct rise in retail prices throughout the Eastern part of Canada. A better understanding of how gasoline prices are determined, how gasoline markets function, and how the product makes its way through the supply chain, can help explain why the Canadian fuels market responded as it did.

As Harvey approached the Gulf Coast, it had the potential to impact a region that is home to more than half of the refining capacity in the entire U.S., and as it turned out, nearly a third of U.S. refining capacity was eventually knocked off-line by the storm. Enough refining capacity was curtailed that a portion of the Colonial Pipeline, the largest and most important refined product pipeline in North America, was forced to shut down for a short period due to insufficient product volumes.

Figure 4: North American Product Flows



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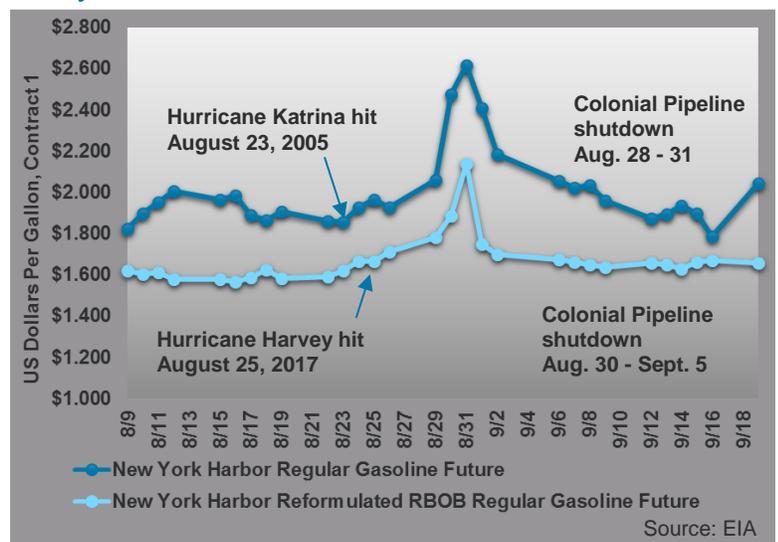
The Colonial Pipeline carries refined products like gasoline and diesel from refineries in the Gulf, travelling up the eastern part of the U.S., to New Jersey where product can then be moved via smaller regional lines to areas throughout the

Northeastern states. This pipeline is the primary supply source for the Eastern U.S., and carries roughly 25 percent of all inter-regional refined product shipments in the country. When there is an interruption in the operation of the Colonial Pipeline, which also occurred during Hurricane Katrina in 2005, this presents an immediate threat to supply, and generally results in a corresponding rise in wholesale gasoline prices. (Figure 4)

Gasoline is traded in large quantities on exchanges around the world; the market for these exchanges is often defined by supply infrastructure, and like all commodities markets, their prices respond to changes in supply and demand. When supplies are constrained in a market with strong demand and limited on-hand inventory, like gasoline in most of the U.S., traders will immediately act to secure future supply, thus bidding up its price. This is what happened after Hurricanes Harvey and Katrina, where futures contracts for gasoline saw a significant and immediate rise in price. (Figure 5)

The rise in futures contract prices has the effect of driving up prices for immediate supply (known as a spot price), which in Canada is reflected by the rack price. There was a distinct rise in Eastern Canadian rack prices (Ontario, Quebec, and Atlantic Canada) following Hurricane Harvey that mirrored the rise of spot prices in comparable markets in the U.S. East (when adjusted for exchange rates). Still, there are typically only small amounts of physical product moving between U.S. and Canadian markets, and so it is less obvious why Canadian wholesale gasoline prices are so heavily influenced by those in the U.S.

Figure 5: Future Contract Gasoline Price Response to Hurricane Harvey 2017 and Hurricane Katrina 2005



This influence is best understood in the context of how markets are geographically defined, and how pricing within those markets can affect the buying behaviour of market participants. Markets are generally delineated by supply infrastructure, or the ability to move product from the point of sale to the point of consumption, and most importantly, in North America, products can move freely across borders. That means that a U.S. wholesale gasoline market like Buffalo, NY competes directly with the wholesale gasoline market in the Greater Toronto Area (GTA).

This brings us to the role of arbitrage, which means the simultaneous buying and selling of a commodity (like gasoline) in different markets to take advantage of different prices. If Canadian wholesalers were to not adjust their prices in response to a hurricane's impact on competing U.S. prices, U.S. buyers could take advantage of relatively low Canadian prices by purchasing any available supply and re-selling at a higher relative price in those U.S. markets. To preserve the availability of Canadian supply, product prices need to reflect a similar value to those in competing U.S. markets (on an exchange-adjusted basis).

Figure 6 shows that in the week after the hurricane struck Texas, wholesale prices in Toronto rose roughly the same amount as Buffalo or New York Harbour. In the following weeks, Toronto's prices declined roughly the same amount as those relevant U.S. wholesale pricing benchmarks, albeit somewhat faster. These correlated wholesale price swings were also present at retail, and are indicative of competitive pricing behaviour between these particular markets.

Figure 6: Wholesale Gasoline Price Changes in \$CDN - Cents Per Litre



The end-result of all this market activity are Eastern Canadian pump prices that were indirectly influenced by a hurricane in the U.S. Gulf Coast. This influence was present in the rise of pump prices directly after the hurricane, and also in the eventual decline in prices as the production and supply of gasoline to the U.S. East Coast returned to relative normalcy.