

# Bottleneck

*What the Fifth District's only major oil refinery explains about high gas prices in the wake of Hurricanes Katrina and Rita* BY DOUG CAMPBELL

If you want to understand why gas prices shot up past \$3 a gallon immediately after Hurricane Katrina hit the Gulf Coast, consider looking at Virginia's sole oil refinery — in fact, the only refinery of any significance in the Fifth District. Almost everything you need to know about gas prices can be explained, at least indirectly, with a visit to Giant Industries' refinery in Yorktown, Va.

The 570-acre facility is dotted by mammoth storage tanks, soaring distillation towers, and miles of pipes. The plant churns out upward of 60,000 oil barrels a day, which may sound like a lot but is actually just a drop in the national bucket of refinery capacity; in fact, it is less than a half percent of the total U.S. daily refinery output. If the Yorktown refinery was shut down — as it temporarily was in 2003 with Hurricane Isabel and then again this fall after a fire — national gas prices wouldn't even blip. But the way Yorktown operated in the aftermath of Katrina provides a vivid picture of how price changes are a function of economic rules about supply and demand,

regulation, and competitive markets.

“Whoever has control of a resource that suddenly becomes scarce — in this case, refinery capacity — those people will experience a substantial increase in profits,” says Stephen Brown, director of energy economics at the Federal Reserve Bank of Dallas. “This is a normal market phenomenon, much the same as owning a piece of land that suddenly becomes valuable.”

Of course, there are other things going on as well. Oil prices, as the Energy Information Administration points out, “are a result of thousands of transactions taking place simultaneously around the world, at all levels of the distribution chain from crude oil producer to individual consumer.” At the same time, the hub of much of this interaction takes place at refineries like the one at the mouth of the York River.


## The Refining Process

Yorktown is about 10 miles southeast of Williamsburg. Giant Industries Inc. bought the 1954-built refinery in 2002 from BP p.l.c. for about \$170 million.

The site employs about 300 workers, including contractors. Much of the area is under construction as the refinery is upgraded to meet new clean fuel laws. Charley Yonker, vice president of administrative services with Giant in Yorktown, says the cost of the improvements is almost equal to the plant's acquisition price three years ago.

The Yorktown facility receives ships loaded with crude oil from around the world but lately has gotten a lot of North Sea traffic. After arriving in Yorktown, crude oil is pumped from the ships via pipes to storage tanks. There it waits just hours or a few days until going through a de-salting process and then being “charged to the unit,” or moved into distillation towers.

These towers — there are 20 of them on the Yorktown site — are where the main refining process happens. Refining crude oil is all about heating and cooling, pressuring and depressuring to separate crude oil's main chemical components — gasolines, diesels, greases, and asphalts. When it enters the tower, crude oil is heated to upward of



*Giant Industries owns and operates Virginia's only oil refinery, which sits on 570 acres and churns out about 60,000 barrels a day.*

800 degrees Fahrenheit, causing it to vaporize. As the vapor rises along the tower's 10-or-so stories, it condenses and collects at different vertical points. Gasoline components, for example, are lighter in molecular weight and rise high in the tower before condensing. Catalysts can be added in the process as well to promote certain chemical reactions. The resulting products are pulled off the tower via pipes at ascending heights. The parts that don't vaporize make tar and asphalt. The whole process can take as little as eight hours.

Yorktown makes three grades of gasoline, two grades of diesel, kerosene, fuel oil, propane, and coke (a high-carbon residue that can be used as a boiler fuel to make steam or electric power). Giant Industries sells to a wide variety of fuel companies, ranging from major oil brands to independents like convenience store chain Royal Farms, which is based in Baltimore.

For gas products, Yorktown sends out most of its output via barges that dock at its pier and usually head north to New Jersey. There, the gas is pumped into storage tanks where the gas firms add the final additives before trucking them to the pumps. A smaller portion of Yorktown's gas is picked up by trucks, whose travel radius is about 150 miles. Additives in this case are added on-site.

### Maxed Out

Yorktown is running at maximum output almost every day. That is why this summer's hurricanes made such a sizable — and positive — impact on Giant Industries' bottom line.

For a short time, Hurricanes Katrina and Rita knocked out many refineries in the Gulf Coast, cutting the nation's refining capacity by about 25 percent. Even well into October about 18 percent of U.S. refining capacity remained idle because of the storms. So even though the United States opened its strategic oil reserve, easing the shortage of crude oil, there remained a shortage of refinery capacity. That's where the bottleneck happened. Meanwhile, demand for gas remained relatively stable. From there, all you need is to look at a simple chart of supply and demand to see why prices rose as quantity dropped.

The Yorktown refinery dealt with the supply disruption by allocating products to its customers based on their average "lifting" levels over the past six months. Instead of being able to collect a full order, customers took 80 percent or so.

The storms hurt refinery capacity more than production capacity. Which means there was crude oil ready to be refined — but with no place to go. If there was more refinery capacity in the United States, the price hikes might not have been so steep. Although existing refineries have expanded in recent years, there has been no new refinery built in the United States since 1976. In addition, some have shut their doors. There were 324 refineries in 1981 but just 144 today. Over the same time, the volume of crude oil refined in this nation has also dropped from 18.6 million to 16.9 million barrels. Meanwhile, demand has grown about 25 percent over the past two decades.

Refinery companies blame environmental regulations. "A lot have

decided not to stay in the business. It's very capital intensive," says Leroy Crow, chief of refinery operations at Giant. "We spend \$80 [million] to \$90 million in 2005 at our refineries [on mandated upgrades] and those improvements have no payback, no return on investment."

The Yorktown refinery's relative isolation illustrates the capacity problem. Building new refineries requires hard-to-find qualities like vast acreage, port access, and ample water and power supplies, not to mention compliance with increasing environmental rules. With Yorktown as the only refinery in the Mid-Atlantic, the gas supply problem was particularly acute in this region. For a time after Katrina, Baltimore endured the highest gas prices in the nation because the Colonial Pipeline running up and down the Mid-Atlantic was virtually dry when four major Gulf refineries serving it were shut down with the storm. And when new crude began hitting the East Coast, it went first to New York ports.

Brown, at the Dallas Fed, said it would take sustained prices of more than \$2.50 a gallon at the pump to make building a new refinery profitable under current regulations. Even then, it takes at least five years to go through a permitting process. That sharply limits the number of possible new entrants.

### Price Gouging?

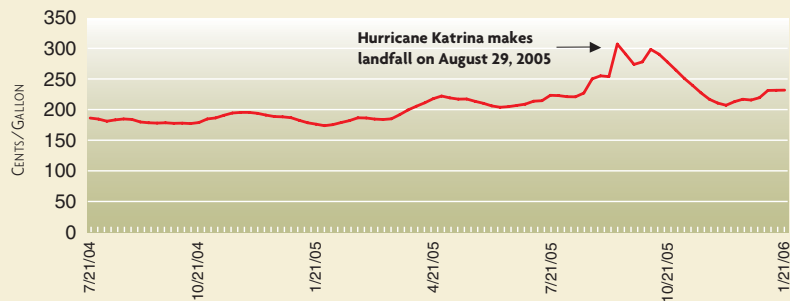
Stock in Giant shot up 45 percent in the wake of Hurricane Katrina. Net earnings jumped from \$6 million in the third quarter of 2004 to \$46.6 million in the same 2005 period. Jacques Rousseau, oil industry analyst

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## Lower-Atlantic Gas Prices

Prices spiked following the hurricanes, but then moved back to pre-storm levels.



NOTE: The Lower Atlantic region: Florida, Georgia, South Carolina, North Carolina, Virginia, and West Virginia. Maryland and the District of Columbia are considered part of the Central Atlantic region.  
SOURCE: Energy Information Administration

at Friedman Billings Ramsey in Arlington, Va., uniformly raised stock price estimates on the companies he follows after the hurricanes and predicted that the impact would be long term. "It is important to keep in mind that the hurricane's impact on inventories should have a long-lasting effect, and refiners are likely to have difficulty replenishing gasoline and distillate stocks in 2006," Rousseau wrote in a note to investors. He also cited refinery downtime for regulatory upgrades and removal of the controversial component MTBE from the gasoline pool as factors that will continue to dampen supply.

Oil companies like Giant are unapologetic about the windfall, describing it is part of the up and down industry cycle. "This works both ways," Crow says. "In 2002, you couldn't give gasoline away. The market is what the market will be."

### Downstream

About 44 percent of the price of gasoline is determined by the price of

crude oil. The next highest portion of gas prices comes in the form of federal and state taxes, about 27 cents of every dollar. Refining accounts for roughly 15 percent. And the smallest portion, about 14 percent, is for the so-called "downstream" activities of marketing and distribution. Baltimore-based Royal Farms is a typical midsize gas retailer. But unlike big oil companies that have their own refining operations, retailers like Royal Farms were largely left out of the Katrina bonus. In general, the wholesale cost of fuel increased faster than retail prices. The supply disruption drove prices up at the pump in large part because retailers like Royal Farms paid higher prices for their wholesale products to ensure they had enough for their customers, and enough to pay for "future, more expensive gasoline deliveries," says the American Petroleum Institute, an industry trade group.

An economist would put it this way: Even if the retailer bought gas at \$2 a gallon today, if he knows that he will be buying it at \$3 a gallon in the

near future, then it behooves him to raise prices. In this way, he replaces inventory in a cost-effective manner. Meanwhile, the higher price signals that the resource is growing scarce and dampens demand. In any case, retailers ended up with no profit advantage because of the hurricanes, industry participants say.

"If anything, we did worse than a normal year," says Rob Rinehart, chief of gas operations at Royal Farms. Rinehart notes that the states of Delaware and Maryland, among others, are subpoenaing records of convenience retailers. "I believe they will find cries of price gouging to be unfounded in the retail sector," he says.

But that didn't stop lawmakers in Washington from holding hearings to question oil company executives about their post-hurricane profits. With consumers complaining about spiking gas prices, politicians responded by proposing taxes on oil firm "windfall profits" and warned against what they termed "price gouging."

It is true that many oil firms profited handsomely in the wake of the hurricanes. Whether that's something that should be legislated away, though, is not so obvious. Many energy economists believe the market should be largely left alone.

"I guess there's a political definition [of price gouging] — that if the change in prices is high enough that constituents call and complain," Brown says. "But as an economist, I have a hard time defining what price gouging is. Prices are signals that there's scarcity. They tell people to be using less gas." **RF**

## READINGS

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