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How Much Will Gustav and Ike Affect Gas Supplies? An Update.

Posted by Gail the Actuary on September 22, 2008 - 5:20pm
Topic: Supply/Production
Tags: diesel, gasoline, hurricane gustav, hurricane ike, hurricane katrina, jet fuel, original [list all tags]

Shortly after Hurricane Ike hit, I wrote an article called Implications of a Ten-Day Refinery Outage. It is a few days later, and we know a little more. The purpose of this article is to give an update on the situation.

Based on what I am seeing now, we are likely to see significant gasoline outages in the next few weeks. These may not be as long-lasting as those with Katrina, but they may temporarily be more severe, at least in some parts of the country. Diesel may or may not be a problem. We are an exporter of diesel, so can theoretically reduce exports if need be. Also distillate (used for diesel) supplies are currently at a more adequate level than are gasoline supplies. Jet fuel stocks seem to be at a relatively adequate level, so shortages may not be a problem.

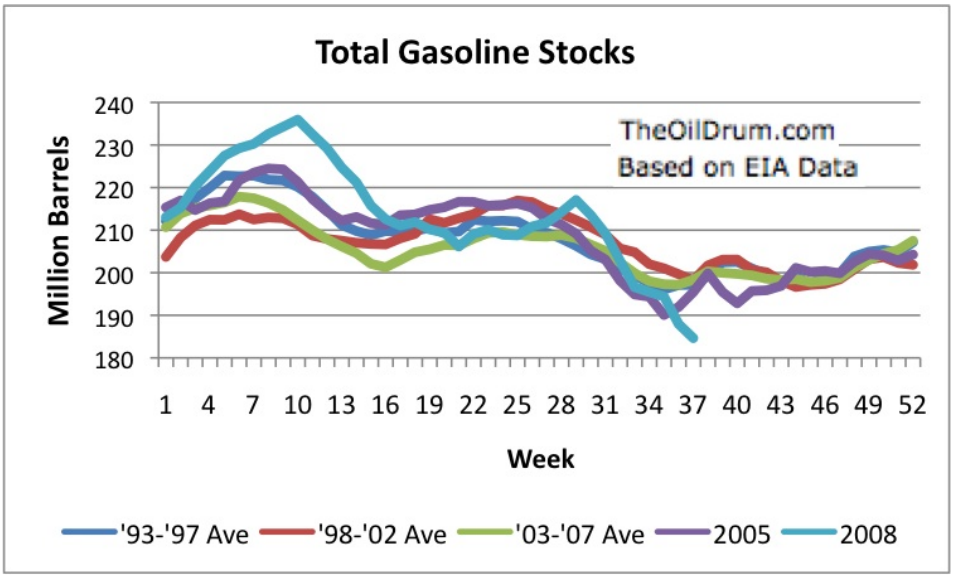

Figure 1. EIA Weekly Gasoline Stocks (includes blending stocks)

As one can see from Figure 1, EIA weekly gasoline stocks are diving, on a path to 180 million barrels of gasoline or less, in the next week. Weekly gasoline supplies when Katrina hit in 2005 declined, but not nearly to the extent we are seeing today.

Refinery Impacts

The DOE provides information with respect to refinery outages. After examining these reports more closely, I realized that there are really three categories of refinery problems we should be concerned about (I only considered two of these categories in my earlier analysis.):

(1) Shut Down = 100% off line

(2) Starting Up = This can continue for several days. I have estimated that refinery capacity listed as "starting up" is 80% off line.

(3) Reduced Runs = This can occur either after starting up or when crude inputs are not available. As in my earlier analysis, I have estimated that production is one-third off line.

I also discovered that by adding together refineries, it is possible to look at state subtotals. This is helpful for seeing how quickly production is getting back online in Louisiana where production was primarily affected by Hurricane Gustav. A graph of refinery shortfalls shows that only now, 19 days later, is production getting back to close to normal.

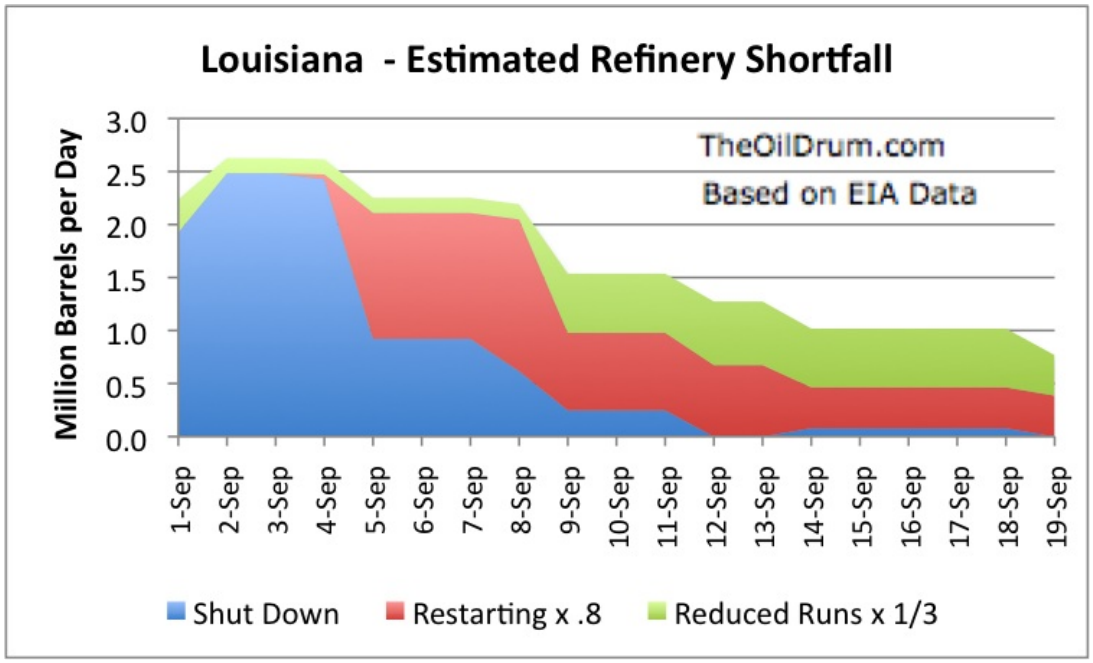

Figure 2. Louisiana Refinery Shortfall

A graph of Texas refinery shortfalls shows that Hurricane Gustav (September 1) had relatively impact. Since Hurricane Ike hit, refinery availability has been reduced by more than 3 million barrels a day.

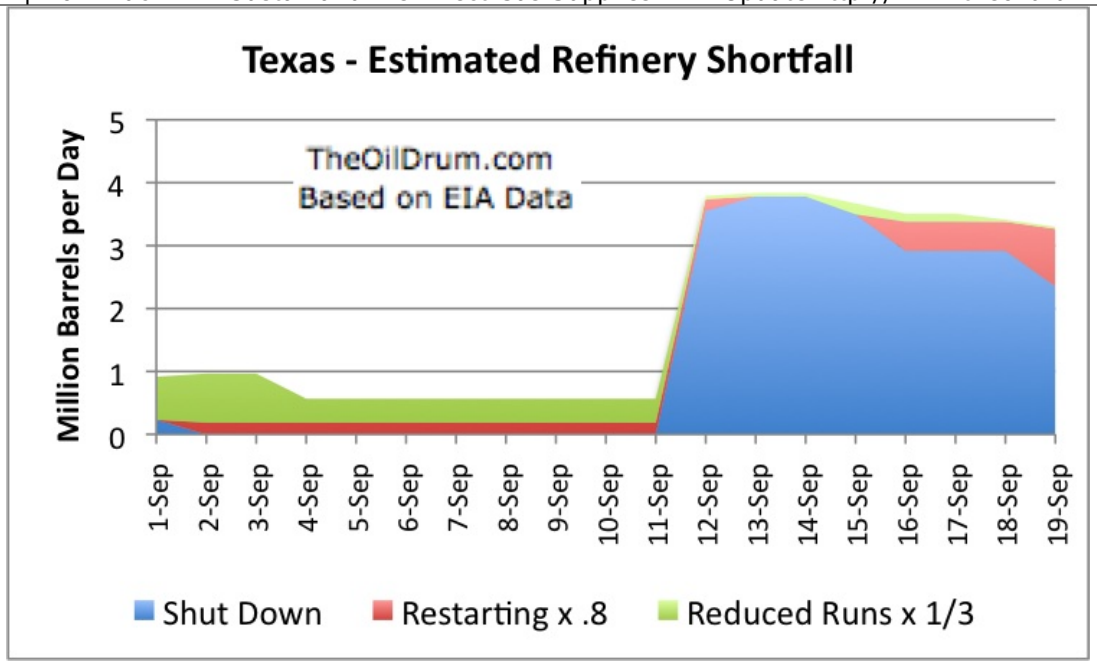

Figure 3. Texas Refinery Shortfall

If the pattern in Louisiana holds in Texas, it may take as much as 20 days after Hurricane Ike before all of the production is back on line. It will certainly be at least 10 days. This would put full production at something between September 23 and October 3. Pipeline delays of up to 18 days could delay full distribution of petroleum products until something between the first and third week in October.

Amount of Refinery Input Shortfall

How much of a shortfall have we been seeing to date? Suppose we compare the amount of crude oil used as refinery inputs in June, July, and August, with the amount of crude oil used as inputs during the week ended September 5 and the week ended September 12 (both after Hurricane Gustav, before Hurricane Ike). The calculation would indicate a shortfall in crude processed of 1.7 million the week of September 5, and 2.0 million the week of September 12.

(This calculation is based on the following: During the months of June, July and August, crude oil used as a refinery input averaged 15.2 million barrels a day. During the weeks ended September 5 and September 12, crude oil used as a refinery input averaged 13.5 and 13.2 million barrels a day. Subtraction would suggest a shortfall of 1.7 million barrels the week of September 5, and 2.0 million barrels the week of September 12.)

In the future, as the impact of the Hurricane Ike shortfall feeds its way through they system, the shortfall of all products combined can be expected to be higher the weeks ended September 5 and 12--especially the weeks of September 19 and September 26, when the Texas refinery outages are added in. I would expect the shortfalls of crude inputs to be in the 2 to 3 million barrels a day range during these weeks, and possibly even into the beginning of October. These shortfalls will take a while to work their way through the system, so we are likely to continue to see shortages for a few weeks.

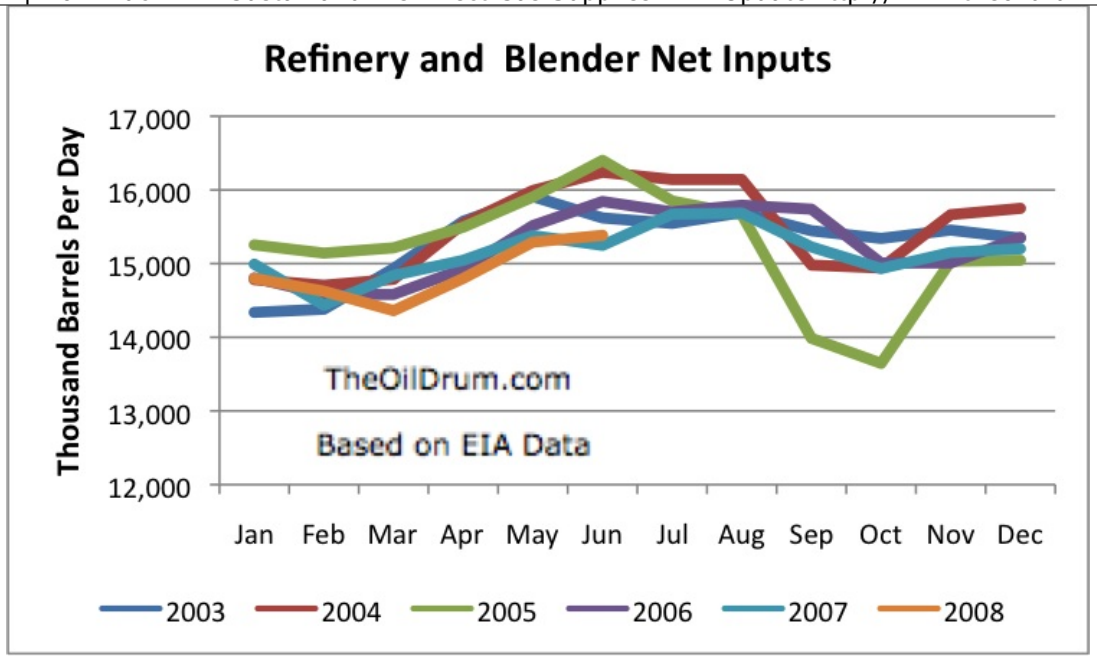

Figure 4. Refinery and Blender Net Inputs

Figure 4 shows that in 2005, when Hurricane Katrina and Rita hit, refinery and blender net inputs dropped by about 1.7 million barrels as day between August and September, and then dropped another 300,000 barrels a day in October. This reflected the combination of Hurricane Katrina (August 29) and Hurricane Rita (September 24) Based on my calculations, the drop in refinery and blender inputs between August and September of 2008 is likely to be a little over 2 million barrels a day. (This assumes in the refinery capacity calculations shown in Figures 2 and 3, the refineries would not be operating at full capacity if open, and that some of the shortfall can be made up with refineries elsewhere.) This drop would be even greater than the Katrina decline, and would occur from a much lower base. Assuming there is not another major hurricane in late September or October, production should bounce back more quickly than with the Katrina-Rita combination.

Gasoline Shortfall

As can be seen from Figure 1, stocks of gasoline were at critically short levels by September 12, the last date shown in the gasoline stock report. Based the rate at which gasoline (and blending stocks) were dropping, gasoline supplies during the first two weeks of September were about 700,000 barrels a day short of keeping inventories at a constant level. The next two or three weeks are likely to have even higher shortfalls of gasoline -- more in the range of 1 million barrels a day. WIth the very low recent inventories, it is hard to see how there will not be shortages some places around the country.

How about Gasoline Imports

If we look at historical data, it becomes clear that we are already importing about as much gasoline as is available, and there is little room to ramp up imports.

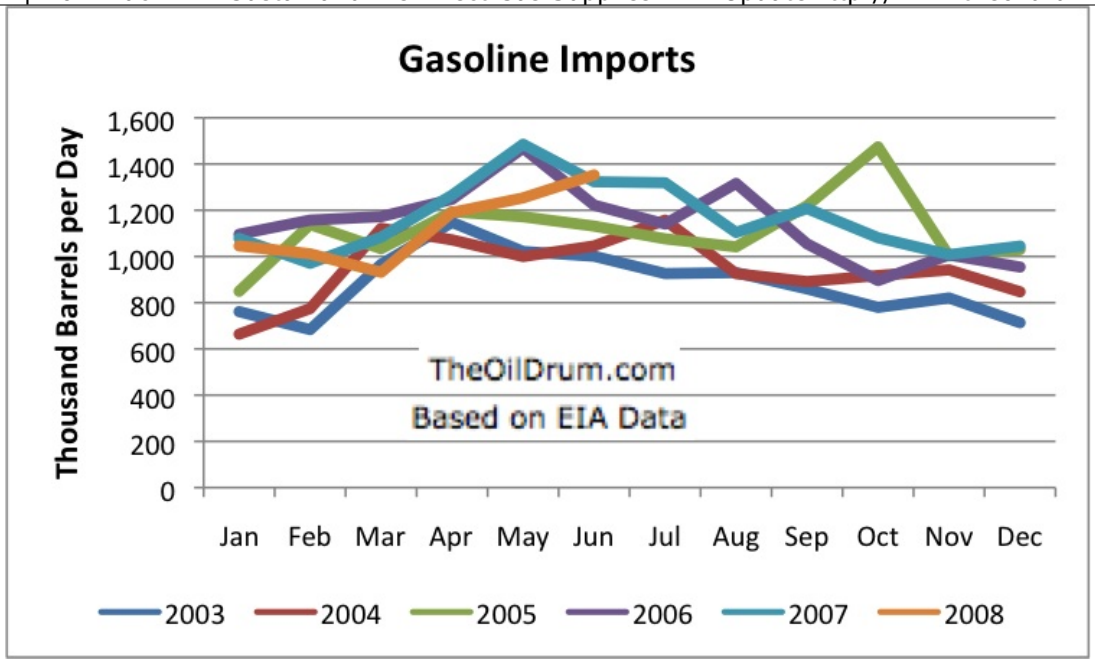

Figure 5. EIA Gasoline Imports (No reduction for exports)

In 2005, the US was able to increase imports by about 500,000 barrels a day in October. In 2008, we are already importing at a very high level. The reason we are able to import gasoline is because European countries tend to use diesel as fuel for their cars, and because of this, there is gasoline left over form the refining process. The amount that is left-over is not going to suddenly increase greatly, so it is unlikely that we could increase our imports of gasoline without drawing down the reserves of the exporting countries.

There was an article yesterday, US will not seek emergency supplies from IEA: DOE. The reasons given were that the rate of recovery from Hurricane Ike should be fairly good, and importing gasoline from Europe will take until October, given the time needed to transport fuel across the Atlantic. By that time, our supplies should be back up. If there really isn't likely to be much available, that adds a third (unstated) reason.

Evidence of Gasoline Shortfalls

A map published by Gasbuddy shows that gasoline prices are higher in the Southeast and in the central part of the country. Both of these are areas where pipelines are operating at reduced rates, or are partly shut down, according to recent DOE reports. The reason why the pipelines are operating at reduced rates is because there is not enough refined products available, because of refinery closures.

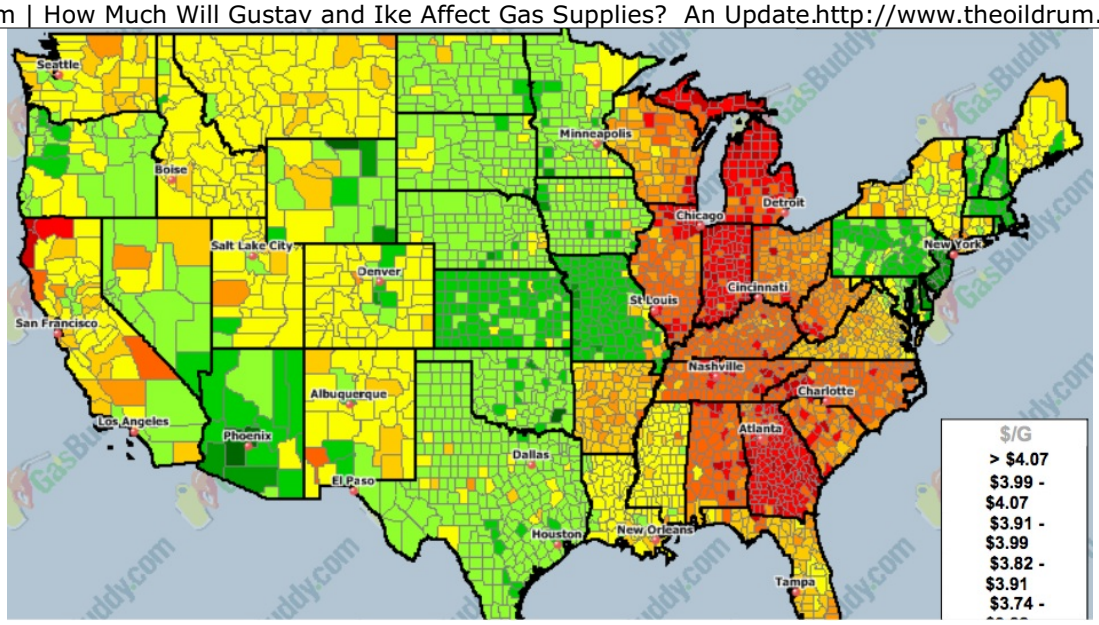

Figure 5. Gasbuddy Map showing variations is gas prices (red is high)

There have been reports of $5 gallon gasoline in Connecticut. One newspaper reports that 85% of Nashville gasoline stations are without gas now.

Diesel and Jet Fuel

Both of these started with better inventories, so may have a little ways to go before shortfalls. Also, with diesel (actually distillate, from which diesel is made), we are a net exporter. If we want more diesel, the easiest way would be to reduce our exports. (If we were to ask IEA for distillate imports while we were exporting it, they would probably laugh at us.)

At ASPO-USA Conference

I am leaving for the ASPO-USA conference shortly after writing this, so will not be able to comment as much as usual. Please forgive a few extra typos. I wanted to get this posted before I left.

Edit

There are a lot of issues that I might have mentioned, but didn't. One of the more important is the possibility that the pipeline system may be near minimum operating level, and that some sections will no longer function if the level gets too low. The areas that would seem to be most at risk are the ones at the ends or lines, or on small spur pipelines. If this should happen, residents in the areas affected areas might find themselves out of all types of refined products (including diesel and jet fuel), unless they had extra supply stored in local supply tanks. Additional supply could theoretically be trucked in, but we have a limited number of trucks for transporting fuel.

Colonial pipeline is one of the pipelines that has had difficulty with adequate supply. The supply begins in Texas/Louisiana. The areas I would expect to be most at risk are on the spur pipelines and farthest north.

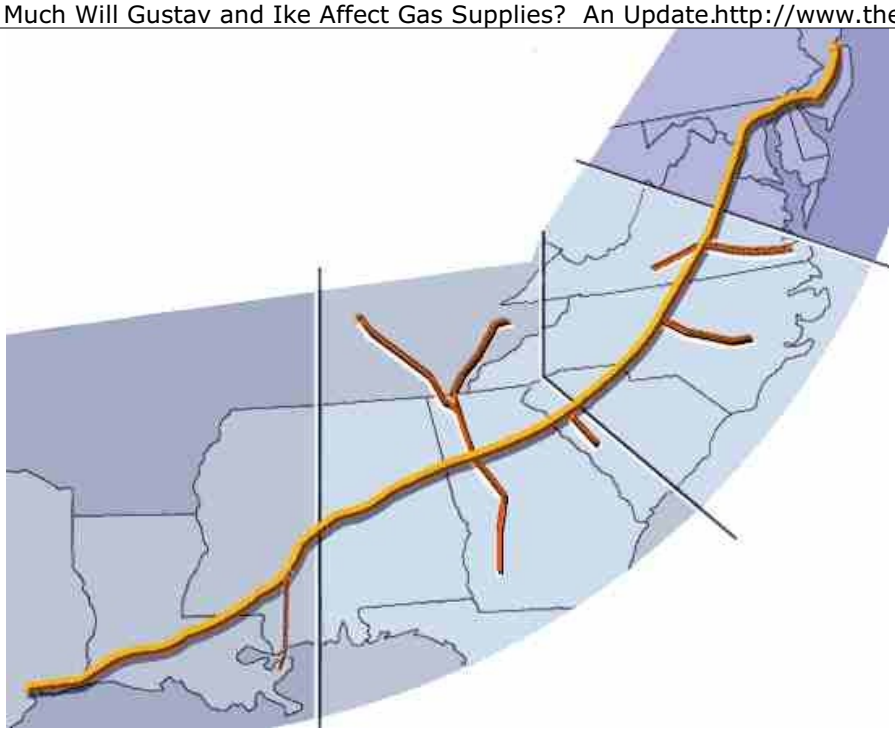

Figure 6. Map of Colonial Pipeline

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