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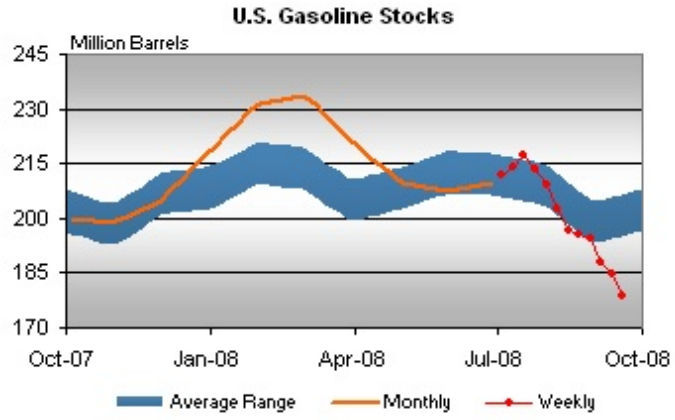
Gas Shortages?: This Week in Petroleum - September 24

Posted by Gail the Actuary on September 26, 2008 - 10:00am
Topic: Miscellaneous
Tags: gas shortage, gasoline shortage, hurricane gustav, hurricane ike, original, refineries, twip [list all tags]

Gasoline shortages are starting to become a problem in the Southern US in areas such as Nashville and Atlanta. This week's "This Week in Petroleum" (TWIP) (included in its entirety under the fold) did indeed show a big drop in gasoline inventory as we expected, but we are still digesting the impact, keeping in mind that these are averaged numbers over four weeks--which of course begs the question of whether or not the full impact of the refinery outages we have seen are in these numbers or not.

In this post, I have prepared a few graphs to supplement this week's TWIP. We know that Hurricane Gustav and Hurricane Ike had a huge impact on refineries, and that these production shortfalls are now slowly making their way through pipelines. It is my view that because Texas refineries have been fairly slow to get back online, and because of the built-in lag due to the slow travel of refined products through pipelines, the present gasoline shortages are likely to get worse in the next two to three weeks.



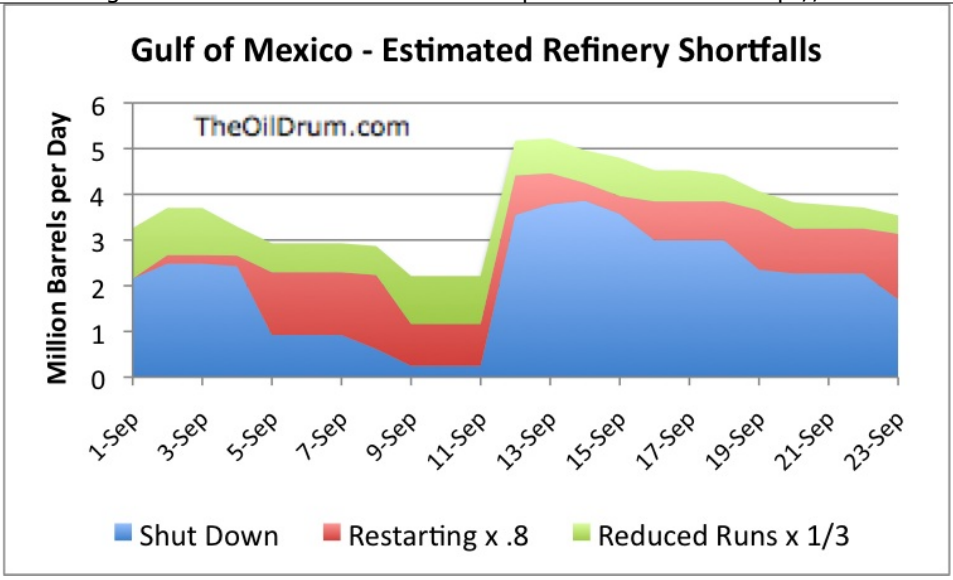


Figure 1. Approximate Gulf of Mexico refinery shortfall, due to impact of Hurricanes Gustav and Ike

The Department of Energy puts out daily reports on the combined impact of Hurricane Gustav and Hurricane Ike, found as this site. Usually, they contain information by refinery as to which ones are shut down, starting up, or operating at reduced rates. The graph shown in Figure 1 has been prepared with the following assumptions:

(1) We lose 100% of refinery capacity if a refinery is reported as shut down.

(2) When refineries are reported as starting up, 80% of their production is off line.

(3) When refineries are reported as operating at reduced rates, their production is low by one-third.

The amount of refined products lost because of the refinery shortfalls will hopefully be less than this amount because

(1) These refineries would not have been operating at full capacity, even if they were open, and

(2) Some refinery utilization can perhaps be shifted to utilization elsewhere.

One could make other adjustments as well. We don't know how accurate the 80% and 1/3 are adjustment factors selected above are. Also, if the real problem is a crude shortfall, there might be refineries elsewhere that are operating with reduced runs that are not near the Gulf of Mexico, so are not counted in the calculation.

Separate Louisiana and Texas Refinery Outage Information

Since the refinery information is published by refinery, it is possible to look at Louisiana (primarily Hurricane Gustav) and Texas (primarily Hurricane Ike) refinery shortfalls separately.

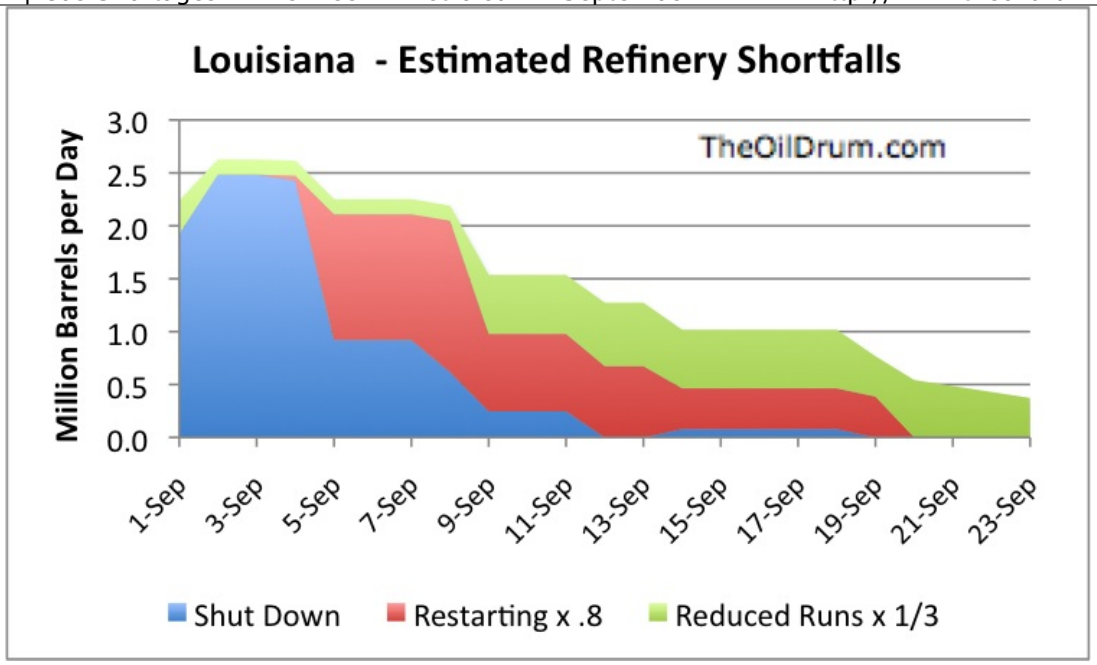


Figure 2. Approximate Louisiana refinery shortfall, due to impact of Hurricanes Gustav and Ike

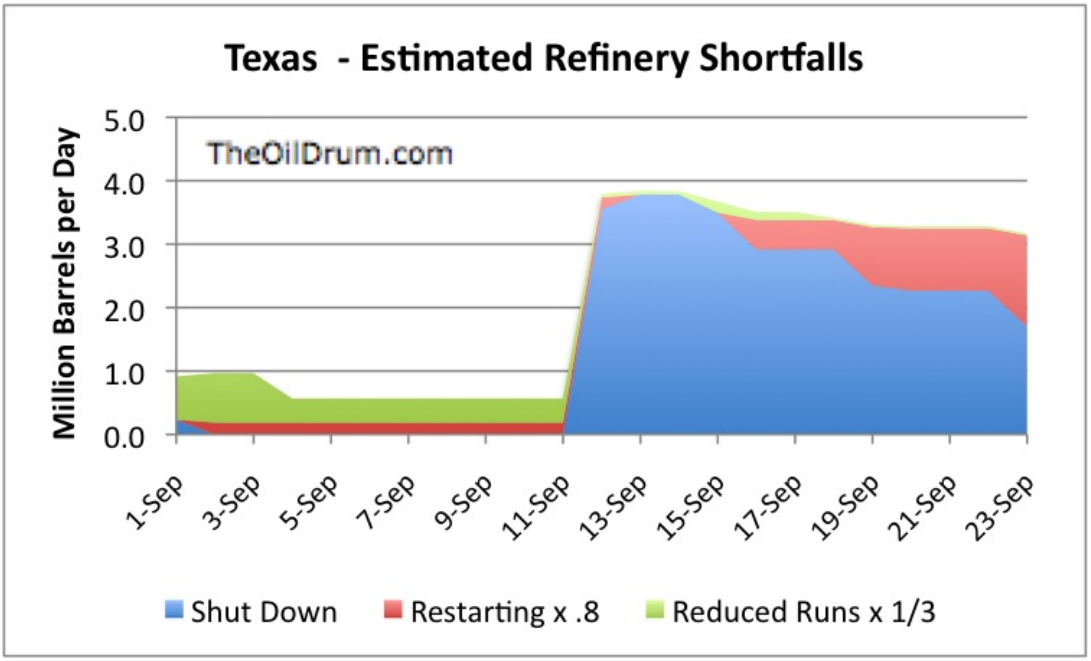


Figure 3. Approximate Texas refinery shortfall, due to impact of Hurricanes Gustav and Ike

From these graphs, we can see that 23 days after Hurricane Gustav, Louisiana production is still not completely back on line, although it is close. Some of the recent reduced runs may be because of a lack of crude to refine, rather than because of a problem with the refineries per se.

Comparing the two graphs, we can see that Texas production seems to getting back on line more slowly after Hurricane Ike than Louisiana got back on line after Hurricane Gustav. It is now 10 days after Hurricane Ike, and there are still refineries shut down. The DOE report of September 23 reports that six refineries in the Texas City and Port Arthur areas with a total of 1.6 million barrels a day of refinery capacity have not yet been able to restart.

The same report also indicates that 995,684 barrels a day of crude oil production is still shut in. This amounts to 76.6% of normal Gulf of Mexico production. There are still shipping disturbances, which presumably affect our ability to import crude oil. The September 23 DOE report regarding hurricane impacts indicates:

> As of 8:00 AM EDT September 23, vessels with drafts over 34 feet are limited to daylight transit only from Sims Bayou to the Houston ship channel turning basin. The Sabine and Neches Channel going into the Port Arthur area is now open to vessels to project depth for daylight transit and limited to drafts of 33 feet at night. Part of the Gulf Intracoastal Waterway (GIWW) in TX has re-opened, but it is still closed from mile marker 350 to 319 and has some closures in LA as well. The Calcasieu Channel into Lake Charles, LA is open to vessels with a draft of 38' or less.

Shortfalls of product

Even before TWIP has come out, there are reports of shortages of refined products. The September 23 DOE report regarding the impact of the hurricanes indicates that a large number of pipelines shipping refined product are operating at reduced rates, presumably because of lack of product to ship. One of these pipelines is Colonial Pipeline, running from Texas to New Jersey. Shortages of gasoline have been reported in Atlanta and Nashville, because of shortfalls of products from this pipeline (and its spur to Nashville).

Products move through these pipelines at only 3 to 5 miles per hour, with the average time to transport oil from Texas to New Jersey 18.5 days. Because of this slow transit (and the fact that the pipelines are not 100% full), the shortages now being felt in areas such as Atlanta and Nashville reflect shortfalls in refining occurring a week or more ago. Given the amount of refinery shortfalls shown in Figure 1, and the relatively slow rate at which they are declining, it is likely that the shortfalls in gasoline available for sale will continue for at least another two to three weeks.

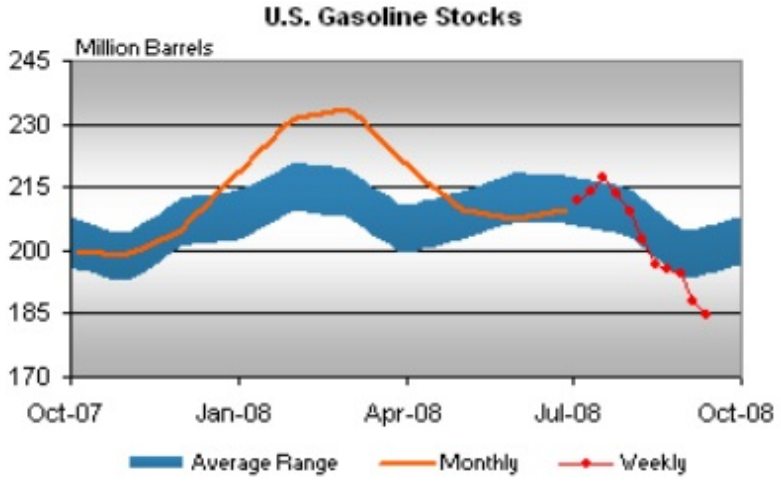


Figure 4. Gasoline Inventory Graph from last week's TWIP (Sept. 17)

My post on the impact of the hurricanes from a few days ago has a few additional graphs. A major reason the hurricanes are having such a significant impact on gasoline supplies is the fact that inventories were very low at the time the hurricanes hit.

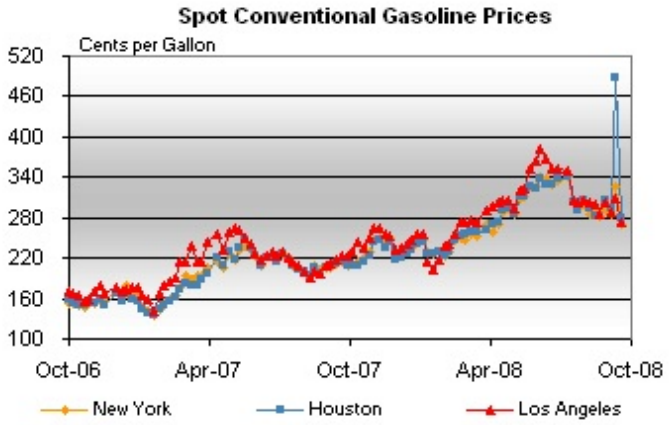
Crude oil inventories may also be disturbed because of shut in Gulf of Mexico wells and difficulty in delivering overseas crude to the area. Crude shortfalls are less likely to be an issue than gasoline shortfalls, because with refineries closed, they are less able to use the inventory. Also, crude can be released from the SPR, if needed.

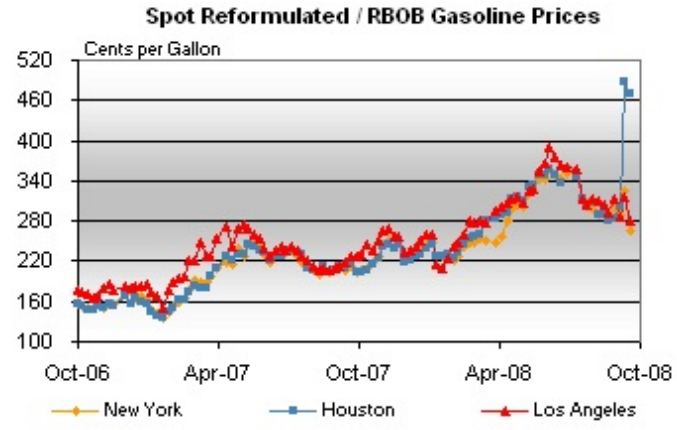
This week's TWIP report

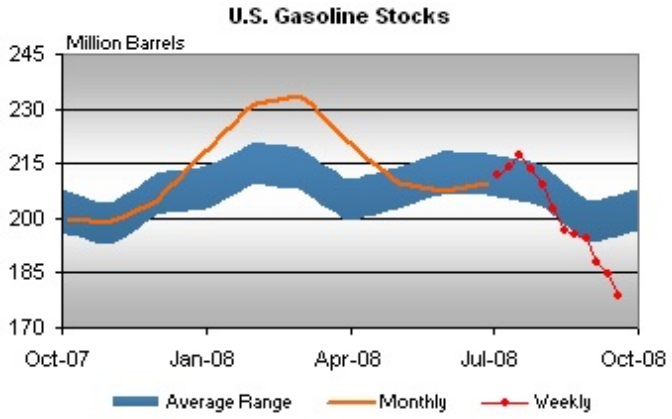
Summary of Weekly Petroleum Data for the Week Ending September 19, 2008

> U.S. crude oil refinery inputs averaged 11.5 million barrels per day during the week ending September 19, down more than 1.7 million barrels per day from the previous week's average. Refineries operated at 66.7 percent of their operable capacity last week. Gasoline production fell last week, averaging about 8.0 million barrels per day. Distillate fuel production decreased last week, averaging nearly 3.3 million barrels per day.
>
> U.S. crude oil imports averaged 7.1 million barrels per day last week, down nearly 1.4 million barrels per day from the previous week. Over the last four weeks, crude oil imports have averaged 8.5 million barrels per day, about 1.8 million barrels per day below the same four-week period last year. Total motor gasoline imports (including both finished gasoline and gasoline blending components) last week averaged 1.2 million barrels per day. Distillate fuel imports averaged 199 thousand barrels per day last week.
>
> U.S. commercial crude oil inventories (excluding those in the Strategic Petroleum Reserve) decreased by 1.5 million barrels from the previous week. At 290.2 million barrels, U.S. crude oil inventories are in the lower half of the average range for this time of year. Total motor gasoline inventories decreased by 5.9 million barrels last week, and are below the lower boundary of the average range. Both finished gasoline inventories and gasoline blending components inventories decreased last week. Distillate fuel inventories fell by 4.2 million barrels, and are in the lower half of the average range for this time of year. Propane/propylene inventories increased by 0.1 million barrels last week but remain below the lower limit of the average range. Total commercial petroleum inventories decreased by 17.9 million barrels last week, and are below the lower boundary of the average range for this time of year.

(Thanks to GS for bringing these to the comments...)







Note

I am writing this post in advance, because I will be traveling from Sacramento back to Atlanta today. (Great choice of destinations from a gasoline point of view!) Perhaps Leanan or one of TOD readers can post the latest report when it comes out.

One interesting calculation is the implied daily drawdown of gasoline inventories, calculated as the change in inventory divided by seven. If this is very high now (say 1,000,000 barrels a day), it is of concern, because it is unlikely to get much better in the near term, unless people in some areas are forced to go without gasoline for lack of product.