



CHEMICAL DATA

Hurricane Harvey Bulletin #2

Thursday, August 31, 2017

Chemical Data has completed an initial assessment of the outages from Hurricane Harvey. We collected and organized raw news data by products, so that clients could begin to understand the potential supply chain impacts. Thus, the outage table in this bulletin follows how hydrocarbons flow through the industry, starting with upstream (oil, gas, refineries), to commodity chemicals, and finishing with commodity plastics. Every product covered by Chemical Data is included.

Jumping to the answer page: Instantaneously, an estimated 58 percent of all commodity chemical capacity in the U.S. is either down or at least significantly affected by Harvey. For commodity polymers, that tally is 44 percent. That brings the total chemicals/plastics industry to 53 percent down or significantly affected. In this assessment, we did not count plants that were throttled. Nor did we count plants that were attempting to restart. Thus, these percentages are a snapshot in time, shortly after Harvey. It is probably fair to say, this is a temporary worst case. The outage pattern started in Corpus Christi, worsened until it reached a crescendo in the Houston area, and then abated as Harvey neared Louisiana.

We expect that for many chemicals and plastics, unencumbered plants will come back within a week or so. Thus, these startlingly high percentages will drop quickly. But we don't expect them to go to zero right away. Here is our concern. We believe that some plants have flooded. Also, some infrastructure remains underwater. Damage crews cannot inspect the damage and give a repair estimate, including a timetable. This is why all the Force Majeures have not yet been issued. These companies do not know what to say, because they themselves have not determined what they are dealing with. By default, nor do we.

Moving beyond the plants, there are also logistics issues. Corpus Christi port has reopened, but only for inner harbor traffic. Ocean access is not available yet. Only shallower draft vessels are allowed. Houston port has reopened to the ocean, but only for shallower draft vessels. There are other restrictions for Houston port. A Texas railroad had declared Force Majeure on a main line connecting to Houston. We don't have a full assessment of the locks for Intracoastal Waterway barges, but fortunately, there were no lock warnings posted by the Army Corps of Engineers.

Directionally, it is evident that the Corpus Christi area will return before Houston. Corpus had 4 inches of rain. Houston had 30-50 inches. It is hard to explain what a year's worth of rain does in five days, in an area that is essentially flat, where water flows slowly, and where much of the land is developed and unable to absorb water. Although most waterways have crested and are coming down, some waterways remain at record flood stage highs and have not yet crested.

A critically important waterway for the industry is Buffalo Bayou. That has gotten a lot of news airtime, when flooded parts of downtown Houston are shown. This bayou leaves Houston and empties into Galveston Bay. At that point, it is a navigable river called the Houston Ship Channel. Based on the incoming surges that we know happened in parts of Galveston Bay (driven by the tides, as one of our flooded consultants can attest), and outgoing floodwaters that were peaking, we don't see how all the plants along the Ship Channel avoided the flooding. It seems that some properties along the Ship Channel had to be inundated. We just don't have confirmation.

That confirmation will become part of the next phase in our analysis. In the next phase, we will work towards forecasting the pricing impacts. Outages are now known by products. Likely durations will become more clear. The worst hit stage along the supply chain will become a rate determining step for that chain. Those stages require deeper investigation and analysis, because that will drive the magnitude and duration of the supply chain disruption.

As clients use this outage data table, please be mindful of these supply chain interactions. Here are four examples. Let's say that you are looking at crude oil. Some reporting services have stated that 15+ percent of offshore USGC oil production was down. Although correct, that is misleading. With the boom in shale, it represents only 4 percent of the total U.S. oil capacity. A more important metric is the refineries, which is where the oil must go. The U.S. has 25 percent of its refining capacity down or significantly affected. So, even though the U.S. lost some oil capacity, oil just went long, while gasoline just went tight.

Moving to chemicals, there are no outages in phthalic anhydride. Capacity is 100 percent available. However, the phthalic precursor is ortho xylene. Ortho is 100 percent down or significantly affected. If phthalic depletes inventories, it will run only as fast as ortho allows. Therefore, a potential shortage in ortho could evolve into a shortage in phthalic, even though all the phthalic capacity is running. That could then spill over to UPR, which is only 5 percent down from Harvey, but uses phthalic anhydride as a raw material.

In another example that spans chemicals to plastics, PET resin is fine. All plants are running. A key raw material is PTA, and it is also has no outages. But, the PTA precursor is PX. PX is 41 percent down. The other raw material is EG. EG is 67 percent down. Take EG upstream through its supply chain, and ethylene is 67 percent down. So, the lesson here is, do not draw the box too narrowly around PET resin. If PX and ethylene and EG don't get back up in a timely manner, PET could be a dead man walking.

In the last example, polymer grade propylene is 77 percent down or significantly affected by Harvey. That is a scary number for such a large volume and important commodity. However, polypropylene is where PGP goes. Polypropylene is 75 percent down or significantly affected. So these two may be in rough balance (assuming similar outage durations), with lost supply offsetting lost demand. That potentially pushes the pressure in the supply chain downstream to the end users.

We have a regular publication that has already been delayed by the hurricane. It needs to be finished. That work will set the hydrocarbon cost structures, which we will use for the next step in the analysis, which is forecasting chemical and plastic price impacts. We expect to begin that pricing work next week, once this week's publication is done.

CHEMICAL DATA'S Hurricane Harvey Outage Database



	% Down	Total Capacity	Units
Upstream			
Oil	4%	9.5	MM BBL/day
Nat Gas	1%	75	BCFD
NGL's	10%	3.6	MM BBL/day
Refineries	25%	18.5	MM BBL/day
Chemicals			
Ethylene	67%	69,685	MM LB
RGP	38%	20,994	MM LB
CGP	57%	16,054	MM LB
PGP	77%	20,800	MM LB
BD	80%	4,945	MM LB
Bz	63%	2,738	MM gal
OX	100%	700	MM LB
PX	41%	8,110	MM LB
Cumene	77%	9,165	MM LB
Cyclo	100%	503	MM gal
Styrene	41%	10,910	MM LB
Phe	34%	5,917	MM LB
Ace	33%	3,706	MM LB
EO-Total	58%	8,315	MM LB
Purified EO	49%	4,885	MM LB
EG	67%	4,684	MM LB
PTA	0%	7,974	MM LB
Phthalic	0%	710	MM LB
Acrylo	72%	3,320	MM LB
PG	64%	1,692	MM LB
MeOH	58%	2,070	MM gal
VCM	45%	20,790	MM LB
Chlor Alkali	?	not covered by Chemical Data	
Chem Sector	58%	Excludes PEO double count	
Plastics			
HDPE	72%	21,616	MM LB
L/LLPE	38%	26,371	MM LB
PP	75%	19,120	MM LB
PS	0%	5,150	MM LB
PVC	44%	19,210	MM LB
PET	0%	8,156	MM LB
PC	28%	1,807	MM LB
ABS	0%	1,603	MM LB
PS	0%	5,151	MM LB
Nylon	20%	2,260	MM LB
UPR	5%	2,150	MM LB
Plastics Sector	44%		
Grand Total	53%		

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