

# Hurricane Harvey Update

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Downgraded to a post-tropical storm, Harvey has left the US Gulf Coast and moved northeastward into the Ohio Valley, but flood warnings remain in effect for parts of eastern Texas and western Louisiana, according to the National Weather Service. The storm left over 40 inches of rain in the Houston area, with the greatest level – 52 inches – recorded at Cedar Bayou.

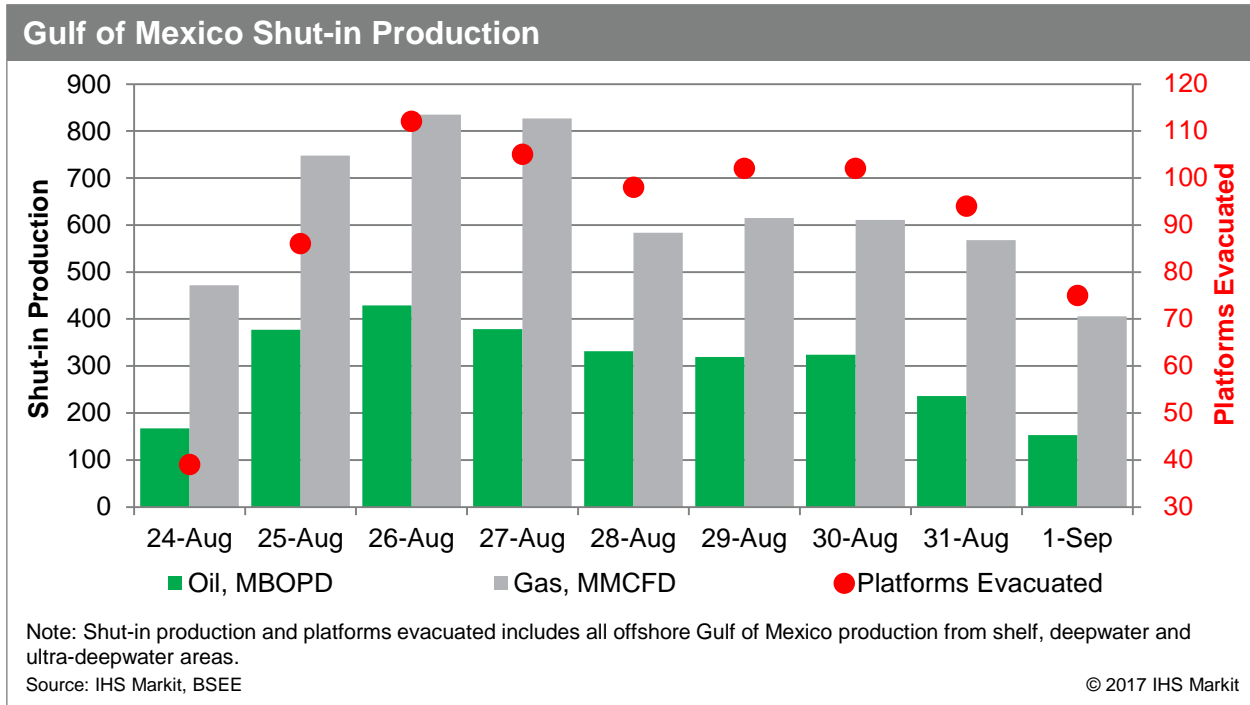
Port of Corpus Christi has reopened with restrictions (43-foot draft instead of regular 52 feet), daylight operation only, with two pilots required. Port handled first ship Thursday. Port Houston container terminals reopened Friday, mainly for landside operations, and will be open on the Labor Day holiday. Vessel traffic is daylight-only, with maximum draft of 37 feet (normally 45). Vessel traffic to ship channel's upper sections, which include refineries and liquid bulk terminals, remains suspended due to strong currents, debris and missing navigational aids. Coast Guard and Corps of Engineers are working to resolve problems and allow pilots to handle larger ships farther up the channel.

Railroads continue to reopen service to Texas region but are dealing with new floods in the Beaumont/Port Arthur area, where water is still rising and rescues continue. Union Pacific, which appears to have the most flood-affected track, is working to restore service on its San Antonio-Houston section. BNSF has begun accepting some Houston-bound import containers at Los Angeles/Long Beach for delivery to Houston when tracks reopen. In addition to repairing washed-out bridges and track, railroads must inspect roadbeds for excess moisture that weakens tracks' load-bearing capability. It's impossible to say when full service could be restored.

## Executive Summary

<b>Crude</b>	<p>Gulf of Mexico production continues to recover, and with no reports of major damage to offshore platforms, it appears Gulf production is set for a complete recovery. Onshore production in the Eagle Ford is also expected to return quickly.</p> <p>Crude logistical disruptions are also showing signs of recovery with key pipelines from the Permian Basin returning to service. Inland-produced crude that cannot be consumed by downed refineries is likely moving to Cushing storage. Some will also likely be exported as ports reopen.</p> <p>We continue to expect little change to our Brent price outlook as a result of this storm.</p>
<b>Refining</b>	<p>Recovery is underway within the Gulf Coast refining industry. All four Corpus Christi facilities (805,000 b/d) are restarting and should be up and running by the end of next week. Several Houston and Lake Charles area plants are also ramping up production.</p> <p>The positive news has reversed gasoline's dramatic price run – at least within the spot market. The impact of the past week's spot price rally has yet to fully reverberate down the value chain, and US retail gasoline prices are likely to rise by another 10-15 cents per gallon on average.</p> <p>The biggest question at this point is the condition of the eight shuttered Houston area refineries, which together represent 15% of US distillation capacity.</p>
<b>Natural Gas</b>	<p>Production losses peaked on August 28th at 2.3 Bcf/d, but by the 31st losses had declined to 0.3 Bcf/d primarily in the Gulf of Mexico. We're monitoring processing losses and the impact on gas quality (gas is too rich), especially in the Permian.</p> <p>Meanwhile, demand reductions from overall cooling temperatures as well as the hurricane totaled approximately 7.5 Bcf/d. Remaining hurricane effects include LNG exports (~ 1 Bcf/day), and in the state of Texas (1-2 Bcf/d).</p>
<b>NGLs</b>	<p>US Gas plant supply and refinery supply of NGLs are slowly recovering due to the storm but are still constrained due to flood related storage and fractionation issues.</p> <p>NGL export terminals continue to remain offline due to operational issues related to the storm despite the gradual restart of the Houston Ship Channel and Freeport. It has been confirmed that Freeport will require dredging to increase draft levels to pre storm levels of 45 feet.</p> <p>The constrained gas plant supply and export capacity has had global implications on NGL pricing. Propane and butane prices remain sharply elevated versus prior to the storm. Ethane prices have fallen significantly as cracker and export demand is constrained. Higher levels of rejection (and lower ethane prices) may be required to balance the system in the near future.</p>
<b>Chemicals</b>	<p>The daily assessment of the impact of Harvey on the chemicals portion of the [energy-to-end product] value chain continues to highlight that logistics (ship, barge, pipeline, rail or truck) are currently a primary barrier preventing a speedy recovery from getting under way. With many base chemicals and derivatives assets down or at reduced rates due to flooding or precautionary measures, the path to recovery seems to be constrained by feedstock (via pipeline, ship or barge) availability from "upstream assets", or limitations on rail and truck access preventing final or intermediate products to be shipped out of or within the southeast Texas/eastern Louisiana area to consumers running "downstream" assets. For the Chemical industry, the initial assessment suggests that Harvey is not a story of assets being damaged by hurricane force winds or a storm surge, but instead the story seems to suggest that flooding resulting from Harvey has crippled or constrained the logistics capabilities that are critical to the safe and efficient operation of so many chemicals assets on the US Gulf Coast.</p>

## Crude



International and US crude prices are slightly lower as of Friday afternoon, with offshore and onshore operators continuing to make good progress in bringing production back online. As of Friday, the volume of crude production still shut-in had declined to about 153,000 b/d (equal to around 9 percent of total Gulf of Mexico production), down from 324,000 b/d just two days ago. Natural gas production shut-in has now declined to about 0.4 Bcf/d (about 13 percent of Gulf production) from 0.6 Bcf/d on Wednesday. There are still no reports of major damage to any of the key offshore platforms. Assuming this remains the case, Gulf production appears set for a complete recovery.

At this stage, we continue to expect little change to our Brent prices outlook as a result of the storm. The global oil market is still weighed down by high inventories, strong production growth, and the revolutionary dynamic of the US onshore shale revolution.

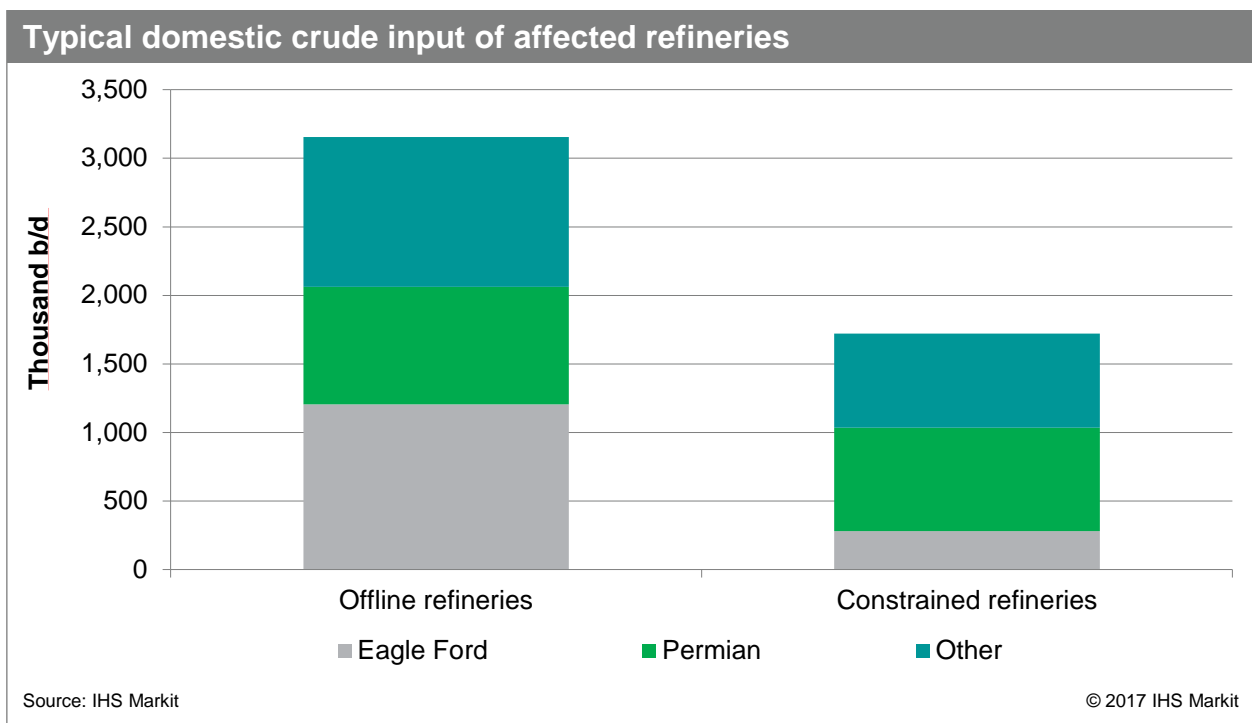
Onshore operations appear to be recovering quickly as well. As much as 500,000 b/d of Eagle Ford shale production (about a third of the play's output) was shut-in in response to the storm, but is now returning. The biggest question for producers is return of key Gulf refineries. The good news for onshore producers is that Corpus Christi refineries appear to be returning relatively quickly, and these plants consume a large volume of Eagle Ford crude.

Harvey-related logistical disruptions are also showing signs of recovery. On Friday Magellan announced it would restart its Longhorn and Bridgetex pipelines by this weekend. These lines deliver crude from the Permian Basin to the Houston refining area. Storage in the Permian has appeared adequate during the pipeline shutdown, and there is little evidence that producers had to shut in production because of the logistical interruptions. Permian and Cushing WTI crude prices, however, remain about \$5 to \$6 per barrel below Brent, the international benchmark, reflecting in part the back up of crude caused by storm-related

logistical constraints. Cushing has been a likely destination for stranded Permian crude, given that tanks at the hub have drawn down from 69 million barrels in April to 57 million barrels as of Wednesday's report. The market incentive to store crude has also returned, as the contango price structure (where future prices are higher than prompt prices) in the WTI futures market has deepened.

As ports return to service, and lingering refinery outages weigh on the market, there will likely be a surge in US crude oil exports in the coming weeks. US crude exports have averaged over 900,000 b/d year-to-date, and are almost entirely sourced out of the Gulf, with Corpus Christi handling about 250,000 b/d. As ports reopen there will also likely be a surge in crude oil imports which may come in faster than refineries re-start. This could lead to a big crude inventory build by the end of next week.

## Refining



Recovery is underway throughout the Gulf Coast refining industry, with all four Corpus Christi facilities (805,000 b/d) beginning to resume operations. Assuming the restart process goes smoothly, these plants could be up and running by the middle of next week. The three Lake Charles refineries (750,000 b/d), which largely escaped any flood damage, are also ramping up production, with Phillips 66's plant receiving an infusion of crude from the Strategic Petroleum Reserve.

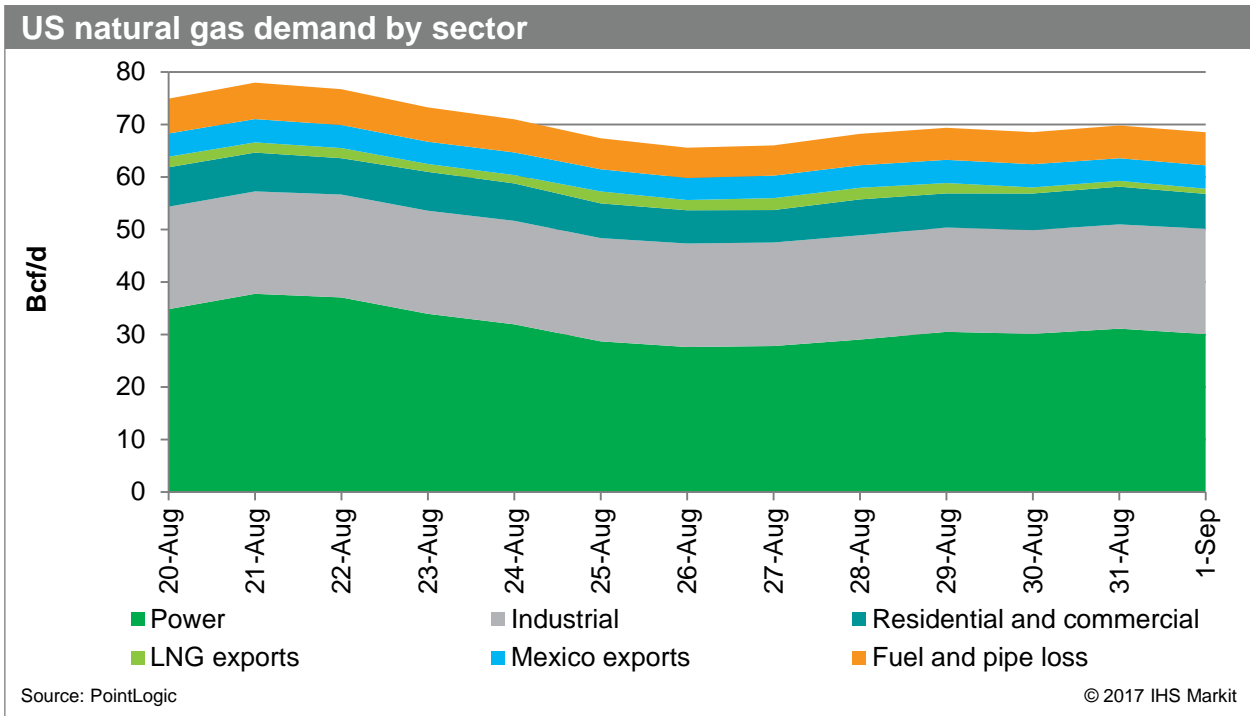
The situation in the Houston-Port Arthur area is more nuanced. Eight of the region's 13 refineries, with a combined 2.7 million b/d of distillation capacity (15% of US total), are fully offline. The other five are operating at reduced rates but reportedly ramping up production. Indeed, Houston's two principal outbound product pipelines (Colonial and Explorer) both hope to be able to resume deliveries from the market this weekend. Though the scale of pipeline deliveries remains to be seen, the biggest question facing the industry now is how much damage was suffered by those nine refineries. So far, no serious damage has been reported, but companies are understandably reluctant to share information until a full assessment of

their refineries can be completed.

The relatively positive news today has reversed gasoline's dramatic price run – at least within the spot market. Retail gasoline prices continue to rise across the country, with particularly severe increases in the south and east. Fears of sharper price increases – or even shortages – have led to panic buying in several major Texas markets. While this has, ironically, led to some stations running dry and US pump prices will almost certainly tick up by another 10-15 cents per gallon, concerns of a broader supply crunch and runaway prices are largely unfounded. As noted, fuel production in the Gulf Coast is beginning to ramp up and the number of European product tankers bound for the US and Latin America has surged. Meanwhile, east of the Rockies gasoline stocks are a relatively high 195 million barrels. For context, the typical daily gasoline production of the nine shuttered Houston-Port Arthur refineries is around 1.2 million barrels.

While most coverage of the Gulf Coast refinery outage is rightly focusing on its disruption of gasoline supply, it has also disrupted US crude demand dynamics. The 13 refineries that are currently offline (including those being restarted) typically process more than 1.7 million b/d of domestic crude. Of this, 720,000 b/d is sourced from the Eagle Ford and 470,000 b/d from the Permian. Another 670,000 b/d of inland crude typically goes to other refineries in the Houston-Port Arthur-Lake Charles area, but has been constrained by pipeline outages. However, as noted, the Corpus Christi refineries (the primary domestic customers for Eagle Ford barrels) are in the process of restarting and the BridgeTex and Longhorn pipelines are expected to resume service this weekend.

## Natural Gas



Demand weakness as a result of a cooling trend in the eastern US, as well as Hurricane Harvey, continues to offset operational difficulties and production interruptions from the storm, with the result that natural gas markets in the US have overall remained relatively calm and well supplied.

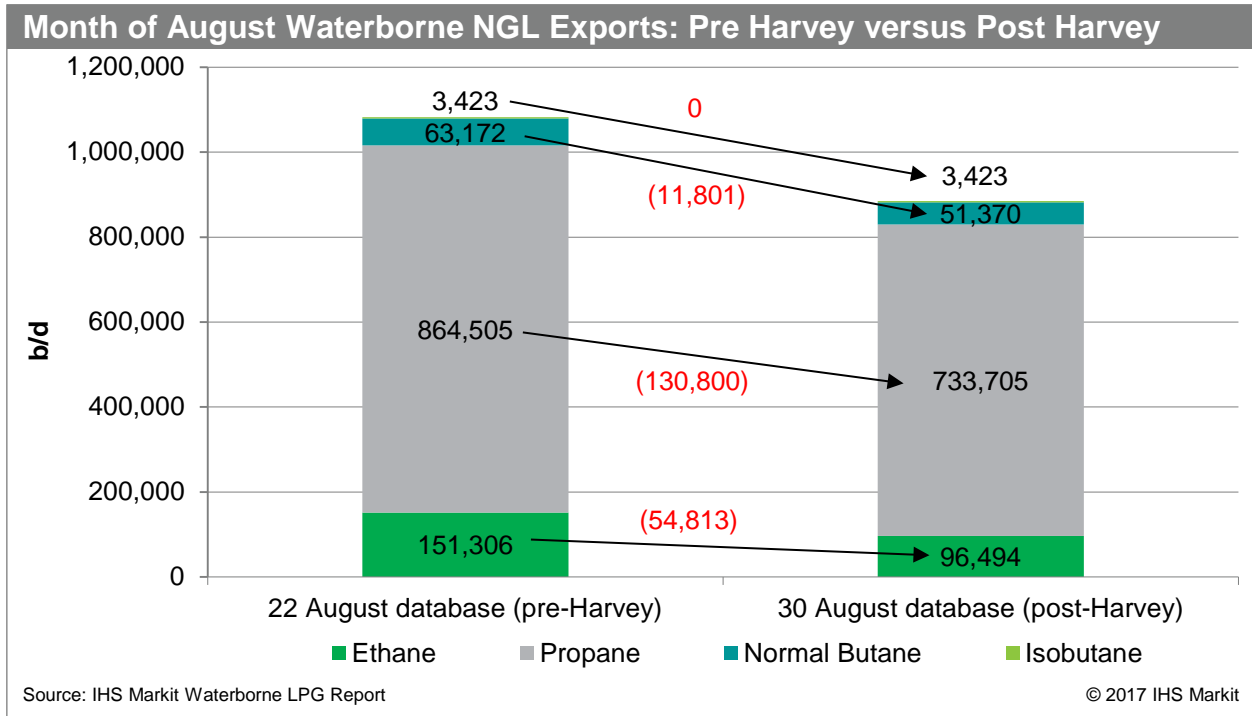
NOAA cooling degree data for the week ended August 30 tells the tale, as US population-weighted cooling degree days totaled 48, 17 (or 26%) below normal and 30 (38%) below last year. With only the Mountain and Pacific regions tracking hotter than normal, this cooling, and the hurricane itself, have translated into a demand reduction of approximately 7.8 Bcf per day (Bcf/d) from pre-hurricane levels, according to OPIS/PointLogic daily tracking data. The state of Texas continues to contribute approximately 2.0 Bcf/d to this overall demand reduction, and within the past 3 days LNG exports have also been weak, running approximately 1.1 Bcf/d, or 0.8 Bcf/d below their pre-hurricane average (see graphic below).

The NOAA forecast for the coming week shows a slight increasing in cooling degree days for the continental US, followed by a drop to below current levels by week's end, indicating that weather is unlikely to support a demand rebound. However, recovery in LNG exports and Texas/Louisiana could contribute 1.5 – 2.0 Bcf/d of demand, albeit in the context of entering the weak shoulder season.

On the supply front, overall US production has recovered to approximately pre-hurricane levels, with Texas data remaining volatile as pipeline and processing constraints continue. Texas experienced a larger-than-normal reduction on September 1 of approximately 670 Mmcf/d in OpusPointLogic's tracking data; however, it is too early to determine whether processing and gas quality issues on Permian pipeline systems (including El Paso) have driven this reduction. The following is a summary of production and operational effects, and the status of several of the most affected pipeline systems:

- Over the 9 days August 23-31, approximately 11.5 Bcf of cumulative production was lost due to Harvey, spread across the Gulf of Mexico (6.2 Bcf or 54%), Texas (3.3 Bcf or 29%), and Louisiana (2.0 Bcf – 17%).
- Production losses peaked on August 28th at 2.3 Bcf/d and by the 31st losses had declined to 0.3 Bcf/d primarily in the Gulf of Mexico.
- Transco Gulf of Mexico production totaled 0.66 Bcf/d prior to the storm, fell to a low of 0.36 and rose back to 0.45 Bcf/d by the 31st leaving production still 0.22 Bcf/d lower than pre-storm levels.
- The other Gulf of Mexico pipe which still appears to be suffering materially from Harvey-related disruptions is Garden Banks where production is about 0.1 Bcf/d lower than pre-storm levels.
- Pipelines in Louisiana which bore the brunt of the storm related losses were ETC Tiger, Gulf South, Transco, Kinetica, and TGPL.
- Pipelines in Texas which bore the brunt of the storm related losses were TGPL, Trunkline, TGT, NGPL, and Transco.
- Helping offset the losses that occurred over this period (8/23-8/31) were increases in production from the Northeast (up 0.3 Bcf/d) and Rockies (up 0.3 Bcf/d in WY and CO) and New Mexico (0.15 Bcf/d)

## NGLs



As of September 1, NGL operations at Mont Belvieu, Texas remain constrained. About 45% of the total 2.4 million b/d of NGL fractionation capacity at Mont Belvieu was affected by Hurricane Harvey. According to IHS' Point Logic Energy, NGL production at natural gas processing plants was down by around 180,000 b/d after the storm hit Texas Gulf Coast. Enterprise announced today that while the partnership sustained minor damage to its assets on the U.S. Gulf Coast, due to the cumulative effects of the impacts of Hurricane Harvey, Enterprise is evaluating the potential curtailment of fractionation and storage services at its Mont Belvieu complex. The impacts from Hurricane Harvey include, but are not limited to, the limitation of critical services provided by third parties, such as nitrogen supplies, flooding, and access to facilities. These impacts are exacerbated by the disruptions to energy demand caused by Hurricane Harvey's effects on refineries and petrochemical facilities on the U.S. Gulf Coast and the closure of all ports on the Texas Gulf Coast, which limit access to export markets. The cumulative effect of these issues has caused brine containment issues and a reduction of fractionation capacity at Enterprise's Mont Belvieu complex. As a result, without relief from these difficulties, Enterprise is evaluating the curtailment of NGL fractionation and storage services.

In addition to gas plant supply, hurricane Harvey had an impact on Texas Gulf Coast refinery operations resulting in curtailing of refinery produced NGLs. U.S. Energy Information Administration (EIA) refinery production data for NGLs is segregated on the sub-PADD level which distinguishes the Texas Gulf Coast region from other PADD 3 regions. Utilizing the data, it is possible to quantify potential impacts on refinery production of NGLs. Overall NGL production from refineries is highly seasonal due to summer and winter grade gasoline effects on butane blending. The month of August is typically when refiners begin to reduce net butane production (that which leaves the refinery gates) in order to blend and meet winter grade gasoline specifications. Accounting for seasonality, the PADD 3 Texas Gulf Coast refineries (those which



were in the path of Hurricane Harvey) are responsible for approximately 5% of total US NGL production or approximately 270,000 b/d of production in August 2017. This percentage has seen consistent declines since the start of the shale boom as gas plant production of NGLs grows significantly and refinery production remains relatively flat. For propane specifically, the PADD 3 Texas Gulf Coast refineries are responsible for approximately 5% of total US production or approximately 85,000 b/d of production in August 2017.

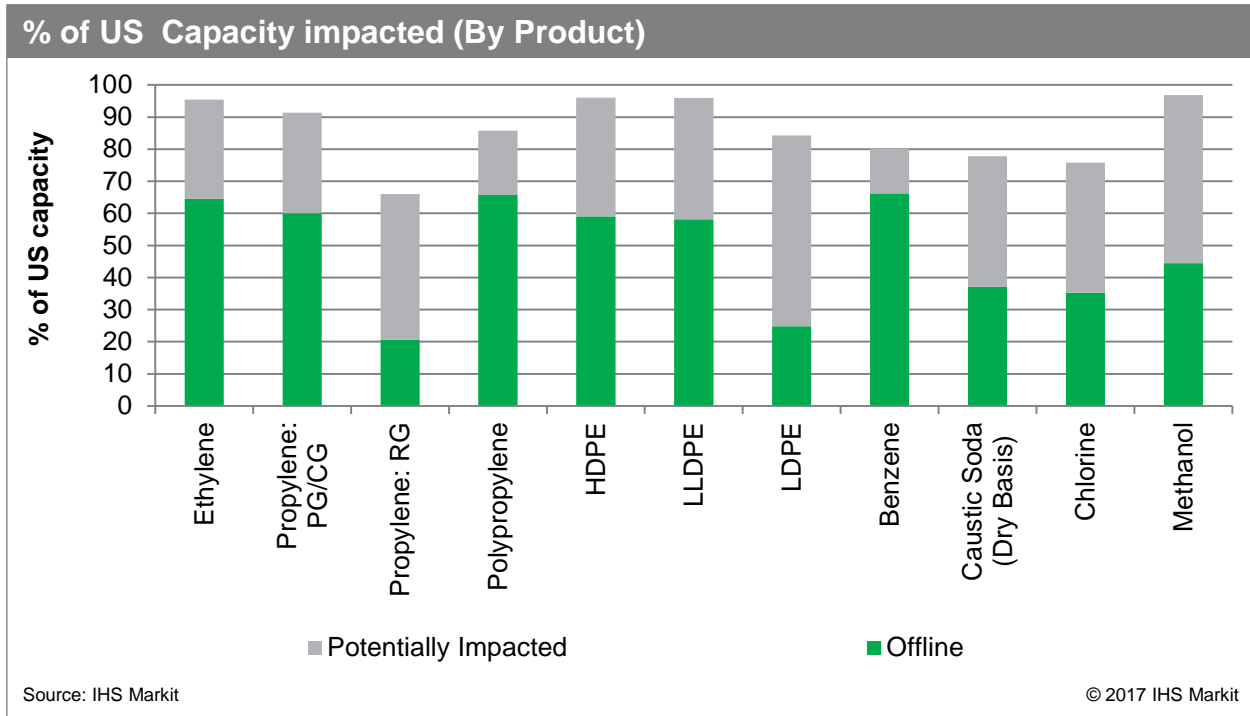
Exports have been curtailed due to marine terminal shutdowns. According to preliminary data from the IHS Waterborne LPG Report, Hurricane Harvey has forced nearly 3.4 MMbbls off of the August export roster for the USGC, or the equivalent 6 VLGC liftings. If the barrels that are no longer leaving the USGC in August follow the same distribution of destinations as the liftings ytd, then 37%, 1.25 MMbbls or about two VLGC cargoes, will not flow to the Far East that otherwise would have. At the same time, Harvey has taken just over 1.5 MMbbls of ethane exports off the Morgan's Point export program for August, the equivalent of just under two VLEC cargoes. If the ethane cargoes followed the same distribution of destinations as the ytd liftings from MP, then 72% (just over 1 MMbbls) would have otherwise gone to India, with the balance destined for Northwest Europe. In summary expectations for total LPG exports for the month of August have been reduced by slightly more than 140,000 b/d from 930,000 b/d prior to the storm to now at 790,000 b/d. Ethane export expectations for the month of August have been reduced from approximately 150,000 b/d to 97,000 b/d.

The price impacts of Hurricane Harvey on NGLs have also affected regional feedstock competitiveness for both olefins crackers and PDH units. Over the past two months, ethane had regained its spot as the most competitive petrochemical feedstock owing to an inventory-constrained LPG market. Even prior to the hurricane, propane inventory was at its lowest days of supply since the inventory-constrained winter of 2013/14. This has led the propane-crude ratio to buck its normal seasonal weakness that is typical during the summer months.

Because of the sharp rise in LPG prices due to Hurricane Harvey and the tepid movements thus far in ethane since the landfall of the storm, ethane has widened its competitiveness. Additionally, because of the sharp rise in propane prices in Asia and the widening of the differential—due to apprehension about the United States' ability to export propane and a stronger-than-expected September Saudi CP price—PDH margins in Asia have fallen considerable since Hurricane Harvey compared with those in Europe and the United States. In addition to the US supply constraints on Asia, there is concern about the Middle East's ability to export additional barrels of LPG owing to the OPEC crude production cut. Ethane prices have fallen sharply to start September as IHS Chemicals shows that 50% of US ethylene capacity is down as well as ethane export capacity. The short term implication of this is the need for higher rejection (and lower ethane prices) to balance the market until capacity is brought back online.



## Chemicals



### Ethylene

A majority of the total US production and consumption of ethylene lies in Texas and Louisiana, with most units potentially impacted by the storm. Texas as a whole has more ethylene capacity compared to derivative capacity, putting relatively more ethylene production at risk compared to derivative capacity. As the storm moves east, reports of units in East Texas are being reported to be offline or running at reduced rates, some due to equipment damage and others due to logistical or feed issues. Complexes in Louisiana are being watched closely as well to determine the extent of the impact. The amount of confirmed outages has increased, pushing the percentage of total US ethylene production offline to 54% and total US ethylene consumption capacity to 35%. As of the time of this writing, no ethylene production units have been confirmed to be offline in Louisiana, although unconfirmed reports point to supply chain constraints and storage issues. Units are expected to begin restart procedures as soon as the storm passes, hopefully by week's end; however, given the complexity of a steam cracker, challenges with obtaining raw materials, logistical and supply chain bottlenecks, and possible unit damages, it may take weeks for the overall ethylene market to approach pre-Hurricane production levels. Given that more ethylene production will be affected versus derivative consumption, the ethylene market may see a temporary tightening of supply and hence higher prices that approach affordability levels.

### Propylene

The amount of confirmed propylene production assets offline is 41% of the PGP/CGP and 26% of the RGP supply with another 31% of PGP/CGP supply and 5% RGP supply at reduced rates. Feedstocks to crackers and PDH have been affected and may curtail operational capability. Additionally, many of the derivative products are reporting that distribution by rail is highly problematic at this time – keeping needed empty cars

from returning and not allowing any full cars from leaving flooded areas in Houston and Port Arthur/Beaumont areas. Derivative consumption of propylene remains at 43% or relative parity to supply with another 17% at reduced rates. Most derivative plants are reporting no significant damage.

Units are beginning restart procedures starting with Corpus Christi area and Texas City area assets with expectations of returning online by next week. Notably, units at Freeport remain online though some reporting reduced rates limited by logistics. Sites harder hit by floodwaters, such as Pasadena, Deer Park, Cedar Bayou and Port Arthur/Beaumont areas, will require extended timing to restart particularly as personnel issues are more prevalent in these areas.

The propylene market is difficult to ascertain in the affected areas since both producers and consumers are down. With propane rising, the underlying cost structure for 10% of the global supply of the market through propane dehydrogenation (PDH) plant will put upward pressure on pricing. The Asian market has not reacted as of yet to this market dynamic but the European market has been tight and will likely start to react first.

## **Polyethylene**

The impact of hurricane Harvey on the polyethylene industry is being felt in many ways. In previous reports we have detailed the storm's impact on production capacity, trade, and logistics. It follows that supply disruptions or at least supply reductions of this magnitude will lead to higher PE prices across the board. We have just updated our short term price forecast for contract PE prices in the US and Canada and these prices have been adjusted sharply higher. Our pre-hurricane forecast reflected our expectations that contract prices would have settled flat in August and begin trending lower by October. The declining price trend was driven by our expectation that significant new production capacity would be coming on stream during the period that PE producers would be negotiating supply contracts for 2018. The combination of oversupply conditions and aggressive positioning associated with winning 2018 supply contracts was expected to bring contract prices down by 6.0 cents per pound by year end exclusive of any non market adjustments that may also be developing.

Our post hurricane forecast now reflects the successful implementation of the proposed 3.0 cent contract price increase for August plus an additional increase of 4.0 cents per pound which is likely to be implemented in October. We also believe contract prices will remain flat post October through the end of the year. We expect to see the "hurricane premium" erode during the first quarter of 2018.

## **Polypropylene**

While there is no doubt there is a dramatic, near term impact due to so much North American capacity currently being offline, there is a positive tone developing as more affected producers are making plans to have production units back online by early next week. The major issues are utilities and the ability to move rail cars to and from plants and this could delay start up timing. Each situation will vary but we still believe rail cars will be shipping from most affected sites by the week of 11 September if not sooner. We will see an uptick in imports for the fourth quarter as insurance to help the region get through the near term supply crunch. However, our expectation is this will be short lived as local production should be adequate to supply the market entering 2018. One thing that has changed in the market is the tone of early 2018 contract negotiations that had begun to take place in August. While it was uncertain who had the leverage previously, currently sellers are in a stronger position as a result of Harvey. Thus we are forecasting margin gains through September/October and for all market segments to be affected. Spot prices are already being

heard upwards of 5 cpp due to expectations of propylene prices increasing in September. We are also expecting PP demand to jump in the coming months in segments that use PP in markets such as carpet, appliances, and pipe as the gulf coast region will require significant supply to help with rebuilding efforts. We also should see a pull on the automotive market as there will be a large amount of vehicles in the region that will need to be replaced.

## **Benzene**

As the week comes to an end, the worst appears to be behind us and producers are looking forward to assessing the damage, if any, and restarting. 80 percent of the US benzene production capacity is located in the states of Texas and Louisiana. 65 percent of the US production capacity was impacted by the storm. The industry is now wading through force majeure announcements and deciding what impact they will have on the balances. FM announcements for phenol and SM undercut benzene demand but major benzene production units remain down in Baytown, Deerpark, Port Arthur, and Beaumont. Even SM in Louisiana which was unscathed by the hurricane may still be impacted if ethylene is unable to move from Texas to Louisiana. The Corpus Christi, Freeport, Houston and Texas City Ports reopened yesterday on a restricted basis and reestablishing the marine supply chain will be critical to move feedstock into sites that are running reduced and product out of storage tanks. Spot benzene prices have stabilized for now just above where prices were situated just prior to the storm.

## **Toluene**

Toluene prices have surged over the last three days as gasoline prices and blend values have spiked. The IHS blend values have increased to over \$2.50 per gallon. Prior to the storm, blend values were near \$2.15 per gallon. The concern over a gasoline shortage will lead to refiners focusing on gasoline production as they enter into a restart mode. However, the Houston and Port Arthur area refineries that are down have yet to enter into restart and the expectation is that their return will be a slow process over the next two weeks.

## **Mixed Xylenes**

Mixed xylenes production remains down in Baytown and that will affect the PX production on the site, which is also down. Deerpark is also a major mixed xylenes producer and remains down. The sites are expected to return slowly with the restart process not expected to begin until next week at the earliest. Production in Texas City is at reduced rates but there are no plans to shut down the units and the Corpus Christi refiners are in restart mode this weekend. The mixed xylenes production loss is mostly offset by the lost PX production. The Lake Charles refinery has reduced rates but was just coming back from a planned turnaround when the storm hit Houston. The site is expected to make on-spec mixed xylenes by next week.

## **Para-xylene**

As Hurricane Harvey heads inland, a little over 50 percent of the US capacity has been shutdown or running reduced due to the hurricane. PX production will be restarting in Corpus Christi over the next week but the restart process will go slowly with more focus on gasoline units getting online first. PX production will continue to be down in Baytown into next week. Production at Texas City will run at reduced rates until the refinery is able to increase rates and produce more mixed xylenes. Port traffic is starting to move again and that will allow product to move out and imports to arrive. EU is expected to send up to 20kt of PX to the U.S. Expectation is for PX to be tight over the next month but PTA production will also be hampered by a loss of

meta-xylene and MEG feedstocks.

## **Chlor Alkali/Vinyls**

The skies are sunny over the coastal Texas, but metaphoric clouds still hang over the Chlor-alkali/Vinyls (CAV) industry in the area. The four chlor-alkali plants previously reported to be shut down due to the storm remain off-line, and operations at others are still cut back. Constraints on the transportation of goods in and out of the region continue to plague efforts to restore normal operations. Yesterday, Olin Corporation was added to the list of producers declaring Force Majeure. The Force Majeure declaration notes that even though all the plants at the Freeport complex are operational and none were damaged by the storm, Olin has been forced to reduce production due to logistics constraints from truck, railroad and marine transportation, and further production curtailments are likely to occur at the Freeport facility until supply and logistics services are fully restored. Therefore, Olin declared Force Majeure on August 31 for product shipments from its Freeport, Texas facility, including EDC product that is usually directed to the export market in Asia. While caustic soda demand on the Texas Gulf Coast has been tempered by chemical production and refinery outages, production loss is expected to exceed demand loss, moving the market to a tight supply/demand position. On August 31, Olin announced a Commercial Grade caustic soda price increase of \$80 per dry short ton and a Membrane Grade caustic price increase of \$100 per dry short ton, both increases for implementation immediately or as contracts allow. On September 1, Shintech announced a price increase of \$100 per dry short ton on Membrane Grade caustic. In the hydrochloric acid market, supplies that were tight before Harvey hit Texas are even tighter and are expected to continue to be so for the near-term future, at a minimum.

As of Friday September 1, 25% of US PVC capacity remains offline due to the hurricane impacts. The duration of the supply interruptions remains uncertain. Regarding PVC prices, Westlake has followed with a similar price increase for the domestic market of 5 cpp. Going forward, with much higher PVC demand this year than in 2016, we expect the supply/demand balance to be tight. However, 54% of new US single-family housing starts are in the South; therefore, some demand for PVC pipe, siding, and windows has also slowed in the short term because of wet weather and flooding.

## **Methanol**

Little has changed for methanol at this point as work continues to restart units as well as await clearance from the ports and rail roads. Thus far we know that at least one Texas based methanol unit tripped during the flooding and is restarting while two units are understood from market sources to have been shutdown due to a lack of logistics to move methanol or its derivatives out of the area. The storm has moved east past the Beaumont facility without incident. Spot methanol market activity has resumed for September with prices elevated by around \$26 per metric ton (an 8.6% increase) over where they were prior to the storm.

## IHS Markit Customer Care:

CustomerCare@ihsmarkit.com

Americas: +1 800 IHS CARE (+1 800 447 2273)

Europe, Middle East, and Africa: +44 (0) 1344 328 300

Asia and the Pacific Rim: +604 291 3600

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