

TODAY IN THE MARKET

Ethylene was higher on Friday and propylene was steady. Energy futures were flat to lower and ethylene cash costs were mixed. Spot polymer prices remained steady.

Jun MtB-NOVA was bid at 12.75 cpp and offered at 14.5 cpp earlier in the day, but no bids or offers were seen for Jun by market close. Jun last traded on Jun 26 at 13 cpp. Jul was bid at 13.5 cpp against no offers. Outside of the NOVA hub, there were no bids or offers for Jun ethylene for delivery in Texas. Jul TX-Other ethylene traded yesterday at 19 cpp. A Jun TX-Other deal from 6/24 was confirmed at 18 cpp. In Louisiana, Jun Choctaw ethylene traded at 15 cpp, above its last done level of 13.5 cpp. Jun ended the day bid at 14 cpp and offered at 16 cpp. Jul was bid at 14 cpp but no offers were seen. A Jul/4Q 2019 Choctaw ethylene spread traded at 0.125 cpp backward, and a Jul/Oct-Nov Choctaw ethylene spread also traded at 0.125 cpp backward. Jul LA-Other ethylene traded at 20 cpp. The MTD 45-day weighted average for Jun TX/LA ethylene was 14.107 cpp, up 0.840 cpp from May.

The propylene market was quiet today. Jun MtB-EPC PGP was bid at 34 cpp but no offers emerged. A Jun MtB-EPC deal from 6/18 was confirmed at 33 cpp. Jul was bid at 33.25 cpp, also against no offers. The MTD 45-day weighted average for Jun all Texas PGP was 32.728 cpp, down 5.617 cpp from May. No bids or offers were seen for Jun MtB-EPC RGP. A Jun MtB-EPC deal from yesterday was confirmed at 23 cpp; two Jul MtB-EPC deals from yesterday were confirmed at 23 cpp. Jul was bid at 23 cpp against no offers. The MTD 45-day weighted average for Jun all Texas RGP was 23.337 cpp, down 2.127 cpp from May.

In operations news, ExxonMobil's BOP-2X olefins unit at Baytown was flaring today due to an unplanned shutdown of the unit's ethylene recovery compressor, according to a filing made to the TCEQ. The filing advised that flaring will continue until Saturday and noted that the event's impact to production was minimal.

Aug NYMEX crude settled at \$58.47/bbl, down 96 cents from Thursday's settle. Aug ICE Brent settled at \$66.55/bbl, unchanged. Aug NYMEX nat gas settled at \$2.308/mmBtu, down 1.6 cents.

Ethylene cash costs were mixed. Jun ethane-based costs were down 0.1 cpp at 8.1 cpp. Propane-based costs were unchanged at 12.2 cpp. Butane-based costs were down 0.5 cpp at 10.8 cpp. The ethane-ethylene spread moved from 7.6 cpp to 7.7 cpp. The spread between ethane and HDPE BM (FOB Houston) was 0.1 cpp wider at 30.3 cpp. The propane-PGP spread moved from 23.2 cpp to 23.4 cpp. The spread between propane and HoPP raffia (FOB Houston) was 0.2 cpp wider at 34.4 cpp.

Jun HDPE BM HIC (loop-slurry process) ended the week unchanged at 37 cpp, while Jul was at 36 cpp, down 1 cpp. Jun LLDPE film closed down 0.5 cpp at 35.5 cpp FOB Houston. Jun HoPP inj and HoPP raffia were unchanged and at parity at 45 cpp FOB Houston. Total on Friday announced a 3 cpp increase on its PS products effective Jul 1. In domestic resale markets, offgrade HDPE BM ended the week at 37-38 cpp railcar delivered, down by as much as 10 cpp. Generic prime HIPS was steady at 82 cpp and generic prime GPPS was flat at 78 cpp railcar delivered. Imports of HIPS and GPPS from South Korea and Mexico were readily available for domestic resale. In Latin American markets, robust supply of US-produced LLDPE film kept export prices in the mid \$900s/mt CFR WCSA.

CLOSING MARKETS

| Monomers | JUNE | change | MTD cal avg |
|----------------------|---------|----------|-------------|
| Ethylene MtB FOB | 0.13375 | - | 0.13063 |
| Ethylene Choctaw FOB | 0.15000 | 0.01000 | 0.13594 |
| PGP MtB FOB | 0.34000 | - | 0.32813 |
| RGP MtB FOB | 0.23000 | - | 0.21750 |
| Benzene DDP HTC | 2.70000 | -0.05000 | 2.66750 |

Polymers

FOB Houston Bulk Railcar

| | | | |
|----------------|---------|---|---------|
| HDPE Blow Mold | 0.36000 | - | 0.37600 |
| LLDPE Film | 0.35500 | - | 0.36225 |
| HoPP Raffia | 0.45000 | - | 0.47000 |
| HoPP Inj | 0.45000 | - | 0.46950 |

Domestic Resale (DER)

| | | | |
|----------------|---------|---|---------|
| HDPE Blow Mold | 0.52000 | - | 0.52450 |
| LDPE Film | 0.58000 | - | 0.59275 |
| HDPE Inj | 0.49000 | - | 0.50100 |
| HMWPE Film | 0.51500 | - | 0.53275 |
| LLDPE Film | 0.49000 | - | 0.50250 |
| HoPP | 0.53500 | - | 0.55025 |
| CoPP | 0.55500 | - | 0.56900 |
| GPPS | 0.78000 | - | 0.78000 |
| HIPS | 0.82000 | - | 0.82000 |

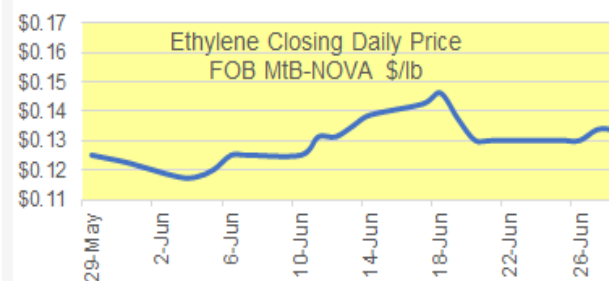
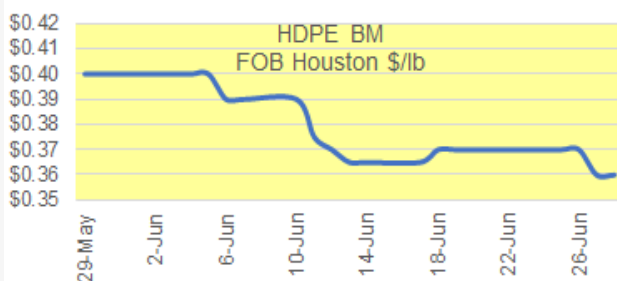
Ethylene Cash Costs

| | | | |
|------------------------|---------|----------|---------|
| Ethane-based | 0.08064 | -0.00079 | 0.08377 |
| Propane-based | 0.12228 | -0.00040 | 0.10885 |
| Butane-based | 0.10786 | -0.00523 | 0.10921 |
| Natural Gasoline-Based | 0.31669 | -0.00930 | 0.29017 |

Ethylene: \$/lb. Mt B NOVA = Mont Belvieu NOVA storage. Choctaw = Choctaw (LA) Boardwalk storage.
Propylene: \$/lb, Mt B EPC = Mont Belvieu (TX) Enterprise storage. Benzene: \$/gal, delivered, duty paid, Houston/Texas City basis. **Resins:** \$/lb, Generic Prime. Domestic prices reflect reseller railcars delivered to North American locations excluding Mexico, West Coast and Pacific Northwest. **Cash Costs** are derived from formulas using OPIS NGLs and PCW petrochemical assessments and employ yield formulas understood to be commonly used by ethylene producers. They are not specific to any particular plant or technology; they are an estimated average.

CLOSING BID/ASK

| Monomers | | Bid | Ask | Polymers | | Bid | Ask |
|--------------------|-----|---------|---------|----------------------------|--|---------|---------|
| Ethylene MtB-NOVA | Jun | - | - | HDPE BM FOB Houston | | 0.36000 | 0.38000 |
| Ethylene MtB-NOVA | Jul | 0.13500 | - | LLDPE Film FOB Houston | | 0.35000 | 0.36000 |
| Ethylene MtB-Other | Jun | - | - | HoPP Raffia FOB Houston | | 0.43000 | 0.46000 |
| Ethylene MtB-Other | Jul | - | - | HoPP Inj FOB Houston | | 0.43000 | 0.46000 |
| Ethylene Choctaw | Jun | 0.14000 | 0.16000 | HoPP Inj Domestic | | 0.52000 | 0.55000 |
| Ethylene Choctaw | Jul | 0.14000 | - | CoPP Inj Domestic | | 0.54000 | 0.57000 |
| RGP MtB-EPC | Jun | - | - | HDPE Blow Mold Domestic | | 0.50000 | 0.54000 |
| RGP MtB-EPC | Jul | 0.23000 | - | HDPE Inj Domestic | | 0.48000 | 0.50000 |
| PGP MtB-EPC | Jun | 0.34000 | - | LLDPE Film Butene Domestic | | 0.48000 | 0.50000 |
| PGP MtB-EPC | Jul | 0.33250 | - | HMWPE Film Domestic | | 0.51000 | 0.52000 |
| Benzene DDP HTC | Jun | - | - | LDPE Film Clarity Domestic | | 0.57000 | 0.59000 |
| Benzene DDP HTC | Jul | 2.34000 | 2.75000 | HIPS Domestic | | 0.80000 | 0.84000 |
| | | | | GPPS Domestic | | 0.76000 | 0.80000 |



CLOSING SPREAD FORWARD CURVES (\$/lb)

| | Ethylene-Ethane | HDPE BM-Ethane | PGP-Propane | HoPP-Propane |
|--------|-----------------|----------------|-------------|--------------|
| Jun-19 | 0.07672 | 0.30297 | 0.23362 | 0.34362 |
| Jul-19 | 0.07776 | 0.30276 | 0.22600 | 0.33475 |
| Aug-19 | 0.07943 | 0.30318 | 0.22563 | 0.33313 |
| Sep-19 | 0.07729 | 0.29729 | 0.22531 | 0.32781 |
| Oct-19 | 0.07411 | 0.29161 | 0.22425 | 0.32175 |
| Nov-19 | 0.07261 | 0.28761 | 0.22556 | 0.31806 |
| Dec-19 | 0.07279 | 0.28529 | 0.22319 | 0.31569 |
| Jan-20 | 0.07361 | 0.28361 | 0.22392 | 0.31392 |
| Feb-20 | 0.07422 | 0.28172 | 0.22405 | 0.31155 |
| Mar-20 | 0.07566 | 0.28066 | 0.22685 | 0.31185 |
| Apr-20 | 0.07774 | 0.28024 | 0.23400 | 0.31525 |
| May-20 | 0.07838 | 0.28088 | 0.24100 | 0.31850 |
| Jun-20 | 0.07859 | 0.28109 | 0.24490 | 0.31865 |

CLOSING SPREADS (\$/lb)

| | |
|-------------------------------|--------|
| Ethylene - (Ethane x. 0.422) | 0.062 |
| Ethylene - (Ethane div. 2.97) | 0.077 |
| Ethylene - Propane | 0.027 |
| Ethylene - Butane | 0.033 |
| Ethylene-Nat gasoline | -0.067 |
| Ethylene - PGP | -0.206 |
| Ethylene - RGP | -0.096 |
| RGP-Propane | 0.124 |
| PGP - RGP | 0.110 |
| LDPE film - Ethylene | 0.446 |
| LLDPE film - Ethylene | 0.356 |
| HDPE blow mold - Ethylene | 0.386 |
| HDPE inj - Ethylene | 0.356 |
| HDPE HMW - Ethylene | 0.381 |
| LDPE film - Ethane | 0.523 |
| LLDPE film - Ethane | 0.433 |
| HDPE blow mold - Ethane | 0.463 |
| HDPE inj - Ethane | 0.433 |
| HDPE HMW - Ethane | 0.458 |
| PP homo - RGP | 0.305 |
| PP copol - RGP | 0.325 |
| PP homo - Propane | 0.429 |
| PP copol - Propane | 0.449 |
| GPPS - Benzene | 0.414 |
| GPPS - Ethylene | 0.646 |
| HIPS - Benzene | 0.454 |
| HIPS - Ethylene | 0.686 |

Closing spreads are calculated on a straight price basis, not inclusive of costs or co-product credit factors. NGLs used in spreads are OPIS closing prices. Spreads are calculated in \$/lb, using standard conversion factors for NGLs and benzene, which transact in \$/gal.

Closing Forward Curves

| | Ethylene FOB MtB | Ethylene FOB Choc | PGP FOB Mt B | HDPE FOB Hou | LLDPE FOB Hou | HoPP FOB Hou | HDPE FOB Chi | LLDPE FOB Chi | HoPP FOB Chi | Ethane-based Ethylene Cost | Propane-based Ethylene Cost | Butane-based Ethylene Cost | C5-based Ethylene Cost |
|--------|---------------------|----------------------|-----------------|-----------------|------------------|-----------------|-----------------|------------------|-----------------|-------------------------------|--------------------------------|-------------------------------|---------------------------|
| Jun-19 | 0.13375 | 0.15000 | 0.34000 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.08064 | 0.12228 | 0.10786 | 0.31669 |
| Jul-19 | 0.13500 | 0.15000 | 0.34125 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.08016 | 0.13027 | 0.11737 | 0.32137 |
| Aug-19 | 0.13625 | 0.15000 | 0.34250 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.08793 | 0.14060 | 0.13376 | 0.33032 |
| Sep-19 | 0.14000 | 0.15000 | 0.34750 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.09492 | 0.15130 | 0.14880 | 0.33329 |
| Oct-19 | 0.14250 | 0.14875 | 0.35250 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.09956 | 0.15719 | 0.15696 | 0.33319 |
| Nov-19 | 0.14500 | 0.14875 | 0.35750 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10189 | 0.16021 | 0.16004 | 0.33179 |
| Dec-19 | 0.14750 | 0.14875 | 0.35750 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10378 | 0.16345 | 0.16250 | 0.33243 |
| Jan-20 | 0.15000 | 0.15000 | 0.36000 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10611 | 0.16758 | 0.16558 | 0.33375 |
| Feb-20 | 0.15250 | 0.15250 | 0.36250 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10750 | 0.16665 | 0.16349 | 0.33177 |
| Mar-20 | 0.15500 | 0.15500 | 0.36500 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10834 | 0.15987 | 0.15660 | 0.32847 |
| Apr-20 | 0.15750 | 0.15750 | 0.36875 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10750 | 0.15280 | 0.14998 | 0.32134 |
| May-20 | 0.15750 | 0.16000 | 0.37250 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10706 | 0.15173 | 0.14900 | 0.31350 |
| Jun-20 | 0.15750 | 0.16250 | 0.37625 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10687 | 0.15149 | 0.14948 | 0.30820 |
| Jul-20 | 0.16000 | 0.16750 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10695 | 0.15538 | 0.15234 | 0.30712 |
| Aug-20 | 0.16250 | 0.17000 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10699 | 0.15990 | 0.15614 | 0.30544 |
| Sep-20 | 0.16250 | 0.17250 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10695 | 0.16572 | 0.15995 | 0.30642 |
| Oct-20 | 0.16250 | 0.17250 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10684 | 0.17092 | 0.16394 | 0.30566 |
| Nov-20 | 0.16375 | 0.17250 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10706 | 0.17618 | 0.16741 | 0.30497 |
| Dec-20 | 0.16375 | 0.17250 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | 0.10740 | 0.17898 | 0.17088 | 0.30222 |
| Jan-21 | 0.16375 | 0.17250 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | | | | |
| Feb-21 | 0.16375 | 0.17250 | 0.37375 | 0.36000 | 0.35500 | 0.45000 | 0.49000 | 0.47000 | 0.49000 | | | | |

FOB = Free on Board. MtB= Mont Belvieu. Hou = Houston. Chi = Chicago. For a full methodology, visit www.petrochemwire.com

| Ethylene Calendar Averages | | | |
|----------------------------|---------|---------|---------|
| | MTD Jun | May | Change |
| 30-day FOB MtB-NOVA | 0.13063 | 0.12932 | 0.00131 |
| 30-day FOB Choctaw | 0.13594 | 0.13375 | 0.00219 |

| Spot Ethylene Trading Ranges (front month) | | | |
|--|---------|---------|----------|
| | Low | High | Midpoint |
| Today | | | |
| Ethylene FOB MtB-NOVA | - | - | - |
| Ethylene TX-Other | - | - | - |
| Ethylene FOB Choctaw | 0.15000 | 0.15000 | 0.15000 |
| Ethylene LA-Other | - | - | - |
| This Month | | | |
| Ethylene FOB MtB-NOVA | 0.11750 | 0.14625 | 0.13188 |
| Ethylene All Texas | 0.11750 | 0.18000 | 0.14875 |
| Ethylene FOB Choctaw | 0.12125 | 0.15125 | 0.13625 |
| Ethylene All Louisiana | 0.12125 | 0.15500 | 0.13813 |

| Ethylene Weighted Averages | | | |
|----------------------------|---------|---------|---------|
| | MTD Jun | May | Change |
| 30-day Mt B all | 0.14364 | 0.13017 | 0.01348 |
| 30-day LA all | 0.13928 | 0.13438 | 0.00491 |
| 30-day TX/LA | 0.14125 | 0.13182 | 0.01034 |
| 45-day Mt B all | 0.14245 | 0.13149 | 0.01096 |
| 45-day LA all | 0.13841 | 0.13498 | 0.00343 |
| 45-day TX/LA | 0.14107 | 0.13268 | 0.00840 |
| | MTD Jul | Jun | Change |
| 45-day Mt B all | 0.18315 | 0.14245 | 0.04071 |
| 45-day LA all | 0.15833 | 0.13841 | 0.01992 |
| 45-day TX/LA | 0.17872 | 0.14107 | 0.03765 |

| Ethylene Spot Volumes (MM lbs) | | |
|----------------------------------|---------|------|
| | MTD Jun | May |
| Current Month Phys 30d - TX & LA | 219.5 | 148 |
| Current Month Phys 30d - TX only | 144.5 | 90 |
| Current Month Phys 30d - LA only | 75 | 58 |
| Current Month Phys 45d - TX & LA | 249.5 | 191 |
| Current Month Phys 45d - TX only | 164.5 | 126 |
| Current Month Phys 45d - LA only | 85 | 65 |
| Next Month Phys 45d - TX & LA | 84 | 28 |
| Next Month Phys 45d - TX only | 69 | 18 |
| Next Month Phys 45d - LA only | 15 | 10 |
| Forward Physical - TX & LA | 3 | 12 |
| Spreads Physical - TX & LA | 185 | 189 |
| Index Physical - TX & LA | 42 | 23 |
| All Paper | 34 | 72.2 |

| | 28-Jun | 27-Jun | 26-Jun | 25-Jun | 24-Jun | 21-Jun | 20-Jun | 19-Jun | 18-Jun |
|-------------------------|--|--------------------------|---|------------------------------------|------------------------------------|-----------|---|--|--|
| June Physical | .15 Choc | | .12875 MtB-N .13 MtB-N | .135 Choc | .13 MtB-N .13 MtB-N .18 TX-O | .135 Choc | .135 MtB-N .1375 Choc .135 Choc .135 MtB-N .13 MtB-N .13 MtB-N | .145 MtB-N .14 Mt B-N .1475 Choc .1475 Choc .145 Choc .14 Choc .1375 MtB-N | .14625 MtB-N .15125 Choc .155 LA-O .155 LA-O .155 LA-O .15 TX-O .15 TX-O |
| July Physical | .20 LA-O | .19 TX-O .13375 MtB-N | | | .135 Choc .14 LA-O | | .185 TX-O | | .185 Jul TX-O .18 Jul TX-O |
| Forward Physical | | | | | | | | | |
| Spreads Physical | .00125 bw Jul/4Q Choc .00125 bw Jul/Oct- Nov Choc | .0 Jun/Jul MtB-N | | .0 Jun/Dec Choc .0 Jun/Dec Choc | | | | | .00125 bw Jun/Jul Choc |
| Index Physical | | | .0 Cal '20 MtB Cal Avg .0075 Jul MtB Cal Avg (Choc del.) | | | | | | |
| Paper | | | | | | | .155 Cal '20 | .16 Cal '20 | .16875 Cal '20 |

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| Ethylene Calendar Averages | | | | Ethylene Weighted Averages | | | | Ethylene Spot Volumes (MM lbs) | | |
|---|---------|---------|----------|----------------------------|---------|---------|---------|----------------------------------|---------|------|
| | MTD Jun | May | Change | | MTD Jun | May | Change | | MTD Jun | May |
| 30-day FOB MtB-NOVA | 0.13063 | 0.12932 | 0.00131 | 30-day Mt B all | 0.14364 | 0.13017 | 0.01348 | Current Month Phys 30d - TX & LA | 219.5 | 148 |
| 30-day FOB Choctaw | 0.13594 | 0.13375 | 0.00219 | 30-day LA all | 0.13928 | 0.13438 | 0.00491 | Current Month Phys 30d - TX only | 144.5 | 90 |
| Spot Ethylene Trading Ranges (front month) | | | | 30-day TX/LA | 0.14125 | 0.13182 | 0.01034 | Current Month Phys 30d - LA only | 75 | 58 |
| | Low | High | Midpoint | 45-day Mt B all | 0.14245 | 0.13149 | 0.01096 | Current Month Phys 45d - TX & LA | 249.5 | 191 |
| Today | | | | 45-day LA all | 0.13841 | 0.13498 | 0.00343 | Current Month Phys 45d - TX only | 164.5 | 126 |
| Ethylene FOB MtB-NOVA | - | - | - | 45-day TX/LA | 0.14107 | 0.13268 | 0.00840 | Current Month Phys 45d - LA only | 85 | 65 |
| Ethylene TX-Other | - | - | - | | | | | Next Month Phys 45d -TX & LA | 84 | 28 |
| Ethylene FOB Choctaw | 0.15000 | 0.15000 | 0.15000 | | | | | Next Month Phys 45d - TX only | 69 | 18 |
| Ethylene LA-Other | - | - | - | | | | | Next Month Phys 45d - LA only | 15 | 10 |
| This Month | | | | | MTD Jul | Jun | Change | Forward Physical - TX & LA | 3 | 12 |
| Ethylene FOB MtB-NOVA | 0.11750 | 0.14625 | 0.13188 | 45-day Mt B all | 0.18315 | 0.14245 | 0.04071 | Spreads Physical - TX & LA | 185 | 189 |
| Ethylene All Texas | 0.11750 | 0.18000 | 0.14875 | 45-day LA all | 0.15833 | 0.13841 | 0.01992 | Index Physical - TX & LA | 42 | 23 |
| Ethylene FOB Choctaw | 0.12125 | 0.15125 | 0.13625 | 45-day TX/LA | 0.17872 | 0.14107 | 0.03765 | All Paper | 34 | 72.2 |
| Ethylene All Louisiana | 0.12125 | 0.15500 | 0.13813 | | | | | | | |

| | 28-Jun | 27-Jun | 26-Jun | 25-Jun | 24-Jun | 21-Jun | 20-Jun | 19-Jun | 18-Jun | 17-Jun |
|-----------------------|---------|------------|-----------------------|----------|--------------------|----------|--|---|---|------------------------------------|
| Ethylene FOB MtB-NOVA | | .13375 Jul | .12875 Jun .13 Jun | | .13 Jun .13 Jun | | .135 Jun .135 Jun .13 Jun .13 Jun | .145 Jun .14 Jun .1375 Jun | .14625 Jun | .1425 Jun .1425 Jun .145 Jun |
| Ethylene TX-Other | | .19 Jul | | | .18 Jun | | .185 Jul | | .185 Jul .18 Jul .15 Jun .15 Jun | .18 Jun |
| Ethylene FOB Choctaw | .15 Jun | | | .135 Jun | .135 Jul | .135 Jun | .1375 Jun .135 Jun | .1475 Jun .1475 Jun .145 Jun .14 Jun | .15125 Jun | |
| Ethylene LA-Other | .20 Jul | | | | .14 Jul | | | | .155 Jun .155 Jun .155 Jun | |

| | 14-Jun | 13-Jun | 12-Jun | 11-Jun | 10-Jun | 7-Jun | 6-Jun | 5-Jun | 4-Jun | 3-Jun |
|-----------------------|---------|--|-----------|--------|---------------------|----------------------|----------|------------------------|-------|--|
| Ethylene FOB MtB-NOVA | .14 Jun | .14 Jun .14 Jun .135 Jun .135 Jun | .1325 Jun | | .125 Jun .13 Jun | .125 Jun .125 Jun | .125 Jun | .1175 Jun .1175 Jun | | .1175 Jun |
| Ethylene TX-Other | | | .17 Jun | | .17 Jun | .17 Jun | .165 Jun | | | |
| Ethylene FOB Choctaw | | .1375 Jun | | | | | | | | .12375 Jun .12125 Jun .12125 Jun |
| Ethylene LA-Other | | .1375 Jun | | | | | | | | |

| PGP Calendar Averages | | | | PGP Weighted Averages | | | | PGP Spot Volumes (MM lbs) | | |
|---|---------|---------|----------|-----------------------|---------|---------|----------|---------------------------|---------|------|
| | MTD Jun | May | Change | | MTD Jun | May | Change | | MTD Jun | May |
| 30-day Mt B | 0.32813 | 0.38886 | -0.06074 | 30-day Mt B | 0.32728 | 0.38345 | -0.05617 | Current Month Phys 30d | 39 | 66 |
| PGP Trading Ranges (front month) | | | | 30-day All TX | 0.32728 | 0.38345 | -0.05617 | Current Month Phys 45d | 39 | 66 |
| | Low | High | Midpoint | 45-day Mt B | 0.32728 | 0.38345 | -0.05617 | Next Month Phys 45d | 0 | 0 |
| Today | | | | 45-day All TX | 0.32728 | 0.38345 | -0.05617 | Forward Physical | 0 | 18 |
| PGP MtB | - | - | - | | | | | Spreads Physical | 52 | 52 |
| PGP TX Non-MtB | - | - | - | | | | | Index Physical | 15 | 0 |
| This Month | | | | | MTD Jul | MTD Jun | Change | All Paper | 54 | 68.5 |
| PGP MtB | 0.32000 | 0.33500 | 0.32750 | 45-day Mt B | - | 0.32728 | - | | | |
| PGP TX Non-MtB | - | - | - | 45-day All TX | - | 0.32728 | - | | | |

| | 28-Jun | 27-Jun | 26-Jun | 25-Jun | 24-Jun | 21-Jun | 20-Jun | 19-Jun | 18-Jun | 17-Jun |
|------------------|--------|--------|--------|-------------------|---------------|--------|----------------|-------------------|-------------------------|--------|
| June Physical | | | | | | | | | .325 MtB-E .33 MtB-E | |
| May Physical | | | | | | | | | | |
| Forward Physical | | | | | | | | | | |
| Spreads Physical | | | | .0025 ctg Jun/Jul | | | | .0025 ctg Jun/Jul | | |
| Index Physical | | | | | -.0325 Jul CP | | -.03375 Jun CP | | | |
| Paper | | | | | | | | | | |

| | 14-Jun | 13-Jun | 12-Jun | 11-Jun | 10-Jun | 7-Jun | 6-Jun | 5-Jun | 4-Jun | 3-Jun |
|------------------|--|--|--------|--------|-----------|-------|-------|---|-------------|-------|
| June Physical | | .32625 MtB-E .325 MtB-E .32 MtB-E .32 MtB-E | | | .33 MtB-E | | | .3325 MtB-E .33 MtB-E | .335 MtB-E | |
| May Physical | | | | | | | | | | |
| Forward Physical | | | | | | | | | | |
| Spreads Physical | | .00375 ctg Jun/Jul .00375 ctg Jun/Jul .00375 ctg Jun/Jul | | | | | | | | |
| Index Physical | | -.035 Jun CP | | | | | | | | |
| Paper | .3475 4Q .3475 4Q .34875 4Q .35 4Q .35125 4Q | .375 4Q .35 4Q .35 4Q .35 4Q | | | | | | .34 Jun-Sep .3425 3Q .36 4Q '19 .36 4Q '19 .38 2Q '20 | .34 Jun-Sep | |

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| RGP Calendar Averages | | | |
|-----------------------|---------|---------|----------|
| | MTD Jun | May | Change |
| 30-day RGP pipe | 0.21750 | 0.24977 | -0.03227 |

| RGP Trading Ranges (front month) | | | |
|----------------------------------|---------|---------|----------|
| | Low | High | Midpoint |
| Today | | | |
| RGP MtB-E | - | - | - |
| RGP TX Non-MtB | - | - | - |
| RGP Non-TX | - | - | - |
| This Month | | | |
| RGP MtB-E | 0.20000 | 0.24000 | 0.22000 |
| RGP TX Non-MtB | 0.27000 | 0.31000 | 0.29000 |
| RGP Non-TX | - | - | - |

| RGP Weighted Averages | | | |
|--------------------------|---------|---------|----------|
| | MTD Jun | May | Change |
| 30-day RGP pipe MtB-E | 0.22500 | 0.25000 | -0.02500 |
| 30-day RGP all MtB-E | 0.22500 | 0.25000 | -0.02500 |
| 30-day RGP all TX | 0.23435 | 0.25000 | -0.01565 |
| 30-day RGP all TX/Non-TX | 0.23435 | 0.25000 | -0.01565 |
| | | | |
| 45-day RGP pipe MtB-E | 0.22719 | 0.24878 | -0.02159 |
| 45-day RGP all MtB-E | 0.22750 | 0.24878 | -0.02128 |
| 45-day RGP all TX | 0.23337 | 0.25465 | -0.02127 |
| 45-day RGP all TX/Non-TX | 0.23337 | 0.25465 | -0.02127 |
| | | | |
| | MTD Jul | MTD Jun | Change |
| 45-day RGP pipe | 0.23000 | 0.22719 | 0.00225 |
| 45-day RGP all MtB-E | 0.23000 | 0.22750 | 0.00225 |
| 45-day RGP all TX | - | 0.23337 | - |
| 45-day RGP all TX/Non-TX | - | 0.23337 | - |

| RGP Spot Volumes (K bbl) | | |
|--------------------------|---------|-----|
| | MTD Jun | May |
| Current Month Pipe 30d | 150 | 130 |
| Current Month Pipe 45d | 200 | 205 |
| Next Month Pipe 45d | 50 | 50 |
| Forward Physical | 0 | 0 |
| Current Month All 30d | 153.2 | 130 |
| Current Month All 45d | 253.2 | 240 |
| Next Month All 45d | 0 | 50 |
| Spreads Physical | 0 | 0 |
| Index Physical | 35.5 | 14 |

| | 28-Jun | 27-Jun | 26-Jun | 25-Jun | 24-Jun | 21-Jun | 20-Jun | 19-Jun | 18-Jun | 17-Jun |
|------------------|--------|------------------------|---|--------|----------|--------|--------|--------|--------|--------|
| June Physical | | .23 MtB-E | .23 MtB-E .23 MtB-E | | .2 MtB-E | | | | | |
| July Physical | | .23 MtB-E .23 MtB-E | | | | | | | | |
| Spreads Physical | | | | | | | | | | |
| Index physical | | .06 Jul Index* | .05 Jul/Aug In- dex* .05 Aug Index* | | | | | | | |

| | 14-Jun | 13-Jun | 12-Jun | 11-Jun | 10-Jun | 7-Jun | 6-Jun | 5-Jun | 4-Jun | 3-Jun |
|------------------|-------------------------|--------|--------|------------|----------------|-------|-----------|-------|-------|-----------|
| June Physical | .205 MtB-E .27 TX-O* | | | .215 MtB-E | | | .31 TX-O* | | | .24 MtB-E |
| July Physical | | | | | | | | | | |
| Spreads Physical | | | | | | | | | | |
| Index physical | | | | | .07 Jun Index* | | | | | |

*not pipeline. ** specified delivery dates.

| MTD EST. ETHYLENE OUTPUT | |
|--------------------------|---------|
| MTD Max GC Capacity | 5.661 B |
| MTD Est GC Output | 4.990 B |
| MTD LBS OUT | 0.671 B |

| MTD OVERALL OPERATING RATES | |
|-----------------------------|--------|
| Texas | 84.5% |
| Louisiana | 100.0% |
| Gulf Coast | 88.1% |

| YTD OVERALL OPERATING RATES | |
|-----------------------------|-------|
| Texas | 90.8% |
| Louisiana | 93.6% |
| Gulf Coast | 91.4% |

| YTD EST. ETHYLENE OUTPUT | |
|--------------------------|----------|
| YTD Max GC Capacity | 36.192 B |
| YTD Est GC Output | 33.098 B |
| YTD LBS OUT | 3.095 B |

| Current Outages | Location | MM lbs/day Ethylene | % US Capacity | Start Date | Status | Planned or Unplanned | Total Days Down/Reduced | Est. MM Pounds Out |
|-----------------------|-----------------|---------------------|---------------|-------------|-----------|----------------------|-------------------------|--------------------|
| Eastman | Longview HCC-3 | 0.849 | 0.40% | 2H Oct 2018 | Shut | P | 246 | 209 |
| Chevron Phillips | Sweeny 22 | 1.640 | 0.78% | 9-May-18 | Shut | P | 415 | 681 |
| BASF/Total | Port Arthur | 5.830 | 2.78% | 4-Apr-19 | Shut | P | 86 | 501 |
| Chevron Phillips | Sweeny 33 | 6.160 | 2.93% | 11-Jun-19 | Shut | U | 17 | 105 |
| Past Outages | Location | MM lbs/day Ethylene | % US Capacity | Start Date | End Date | Planned or Unplanned | Total Days Down/Reduced | Est. MM Pounds Out |
| ExxonMobil | Beaumont | 4.932 | 2.35% | 2-Apr-19 | 24-Jun-19 | P | 88 | 434 |
| Markwest | Javelina | 0.616 | 0.29% | 25-Mar-19 | End-May | P | 68 | 41.9 |
| Huntsman | Port Neches | 1.096 | 0.52% | 10-May-19 | 11-May-19 | U | 2 | 2 |
| Chevron Phillips | Port Arthur | 5.150 | 2.45% | 10-May-19 | 11-May-19 | U | 2 | 10 |
| Dow | Freeport TX-7 | 3.562 | 1.70% | 10-May-19 | 11-May-19 | U | 2 | 4 |
| Huntsman | Port Neches | 1.096 | 0.52% | 23-Apr-19 | 23-Apr-19 | U | 1 | 1.1 |
| Shell | Norco OL-5 | 5.150 | 2.82% | Early Mar | Mid-Apr | P | 40 | 206 |
| Chevron Phillips | Cedar Bayou | 5.041 | 2.40% | 11-Apr-19 | 12-Apr-19 | U | 1 | 5 |
| ExxonMobil | Baton Rouge | 2.945 | 1.40% | 15-Feb-19 | Early Apr | P | 45 | 133 |
| Chevron Phillips | Sweeny 24 | 4.110 | 1.96% | 20-Mar-19 | 31-Mar-19 | U | 10 | 41 |
| Flint Hills Resources | Port Arthur | 3.669 | 1.75% | 27-Feb-19 | 5-Mar-19 | U | 6 | 22 |
| ExxonMobil | Beaumont | 4.932 | 2.35% | 8-Jan-19 | Mid-Jan | U | 6 | Reduced |
| BASF/Total | Port Arthur | 5.830 | 2.78% | 30-Dec-18 | Early Jan | U | 4 | Reduced |
| Dow | Freeport TX-8 | 6.288 | 3.00% | 27-Dec-18 | 29-Dec-18 | U | 2 | 13 |
| NOVA | Geismar | 5.644 | 2.69% | end-Nov | 21-Dec-18 | P | 25 | 141 |
| Chevron Phillips | Sweeny 24 | 4.110 | 1.96% | 22-Nov-18 | End-Nov | U | Reduced | Reduced |
| Eastman | Longview HCC-3A | 0.849 | 0.40% | 15-Apr-18 | 2H Oct | P | 184 | 156 |
| Chevron Phillips | Port Arthur | 5.150 | 2.45% | 9-Sep-18 | Mid-Nov | P | 68 | 350 |