

**TODAY IN THE MARKETS**

Ethylene prices were lower at the Enterprise hub and unchanged at Choctaw. PGP prices were higher, and RGP prices were unchanged. Energy futures were higher while ethylene cash costs were mixed. PE and PP prices were flat to higher.

Feb MtB-EPC ethylene traded at 22.5 cpp, down from its last traded level late yesterday at 22.625 cpp. Feb was bid at 21.5 cpp and offered at 23 cpp. Mar was bid at 21.5 cpp and offered at 22.5 cpp. Mar MtB-EPC ethylene traded twice at 22.5 cpp for dated delivery. The Mar (dated)/Apr (any) MtB-EPC ethylene spread traded at 0.75 cent backward. Mar paper ethylene traded at 22 cpp. Mar MtB-EPC ethylene traded at an OPIS ethane-based formula plus 11.625 cpp. Outside of the Enterprise hub, no markets emerged for Feb TX-Other ethylene. Feb last traded on Feb 9 at 22.5 cpp. Mar TX-Other ethylene traded at 22.5 cpp and at 23.5 cpp. In Louisiana, Feb Choctaw ethylene traded at 18.25 cpp, at parity to its last traded level on Feb 22. Feb was bid at 17 cpp and offered at 19 cpp. Mar was bid at 17 cpp and offered at 18.75 cpp. Mar Choctaw ethylene traded twice at 18.25 cpp for dated delivery.

The calendar average for Feb MtB-EPC ethylene was 21.921 cpp. The calendar average for Feb Choctaw ethylene was 17.941 cpp. The 30-day weighted average for Feb MtB-EPC ethylene was 21.963 cpp. The 30-day weighted average for Feb Choctaw ethylene was 17.986 cpp. The 30-day weighted average for Feb TX/LA ethylene was 20.893 cpp. The 45-day weighted average for Feb MtB-EPC ethylene was 21.984 cpp. The 45-day weighted average for Feb Choctaw ethylene was 17.986 cpp. The 45-day weighted average for Feb TX/LA ethylene was 21.047 cpp.

Feb MtB-EPC PGP was bid at 59 cpp and offered at 64 cpp, giving Feb an implied value of 59 cpp at market close. Feb MtB-EPC PGP last traded on Feb 22 at 51 cpp and was last assessed at 56 cpp. Mar was bid at 58 cpp against no offers. Mar paper PGP traded at 53 cpp, at 54.25 cpp and then at 57.5 cpp. Apr paper PGP traded twice at 49 cpp. The Mar/Apr paper PGP spread traded at 6 cpp backward. No MtB-EPC pipeline RGP markets emerged. Feb MtB-EPC pipeline RGP last traded on Jan 31 at 18 cpp and was last assessed at 22 cpp.

Ethylene: \$/lb. MtB-EPC = Mont Belvieu (TX) Enterprise storage. Choctaw = Choctaw (LA) Boardwalk storage. Propylene: \$/lb, MtB-EPC = Mont Belvieu (TX) Enterprise storage. Styrene: \$/lb, FOB US Gulf basis. Resins: \$/lb, Generic Prime. Domestic resale 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 Markets (\$/lb)**

| MONOMERS                  | FEB     | CHANGE  | MTD CAL AVG |
|---------------------------|---------|---------|-------------|
| Ethylene FOB MtB-EPC      | 0.22500 | -- --   | 0.21921     |
| Ethylene FOB Choctaw      | 0.18250 | -- --   | 0.17941     |
| PGP FOB MtB-EPC           | 0.59000 | 0.03000 | 0.50618     |
| RGP FOB MtB-EPC           | 0.22000 | -- --   | 0.20632     |
| Styrene FOB USG (US Gulf) | 0.50800 | -- --   | 0.50305     |

| POLYMERS - FOB HOUSTON BULK RAIL | FEB     | CHANGE  | MTD CAL AVG |
|----------------------------------|---------|---------|-------------|
| HDPE Blow Mold                   | 0.44000 | 0.01000 | 0.42211     |
| LLDPE Film                       | 0.43000 | -- --   | 0.41789     |
| HoPP Raffia                      | 0.56000 | 0.03000 | 0.52842     |
| HoPP Inj                         | 0.56000 | 0.03000 | 0.52842     |

| POLYMERS - DOMESTIC RESALE (DER) | FEB     | CHANGE  | MTD CAL AVG |
|----------------------------------|---------|---------|-------------|
| HDPE Blow Mold                   | 0.54000 | -- --   | 0.54158     |
| LDPE Film                        | 0.61000 | 0.01000 | 0.59000     |
| HDPE Inj                         | 0.54000 | -- --   | 0.54053     |
| HMWPE Film                       | 0.58000 | -- --   | 0.56316     |
| LLDPE Film                       | 0.51500 | -- --   | 0.53263     |
| HoPP                             | 0.69000 | 0.01000 | 0.64579     |
| CoPP                             | 0.72000 | 0.01000 | 0.67737     |
| GPPS                             | 0.83000 | -- --   | 0.83737     |
| HIPS                             | 0.91000 | -- --   | 0.91842     |

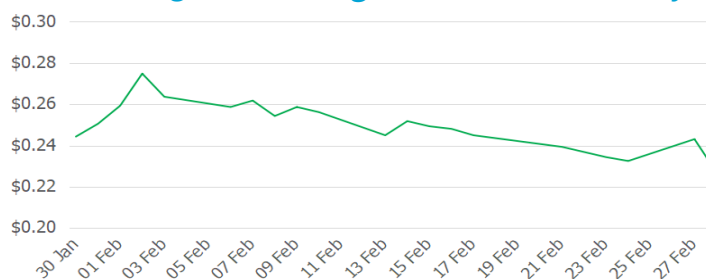
| ETHYLENE CASH COSTS | FEB     | CHANGE   | MTD CAL AVG |
|---------------------|---------|----------|-------------|
| Ethane - Based      | 0.08727 | -0.00818 | 0.10038     |
| Propane - Based     | 0.19167 | 0.00067  | 0.20942     |
| N.Butane - Based    | 0.32551 | -0.04397 | 0.32329     |
| C5 - Based          | 0.38827 | -0.00393 | 0.43007     |

## Closing Bid/Ask (\$/lb)

| MONOMERS                                | BID     | ASK     |
|---|---------|---------|
| Ethylene MtB-EPC Current Month          | 0.21500 | 0.23000 |
| Ethylene MtB-EPC Next Month             | 0.21500 | 0.22500 |
| Ethylene TX-Other Current Month         | ---     | ---     |
| Ethylene TX-Other Next Month            | ---     | 0.22500 |
| Ethylene Choctaw FOB Current Month      | 0.17000 | 0.19000 |
| Ethylene Choctaw FOB Next Month         | 0.17000 | 0.18750 |
| RGP MtB-EPC Current Month               | ---     | ---     |
| RGP MtB-EPC Next Month                  | ---     | ---     |
| PGP MtB-EPC Current Month               | 0.59000 | 0.64000 |
| PGP MtB-EPC Next Month                  | 0.58000 | ---     |
| Styrene FOB USG (US Gulf) Current Month | 0.50800 | 0.50800 |
| Styrene FOB USG (US Gulf) Next Month    | 0.49900 | 0.51260 |

| POLYMERS                | BID     | ASK     |
|-------------------------|---------|---------|
| HDPE BM FOB Houston     | 0.44000 | 0.46000 |
| LLDPE Film FOB Houston  | 0.43000 | 0.45000 |
| HoPP Raffia FOB Houston | 0.56000 | 0.59000 |
| HoPP Inj FOB Houston    | 0.56000 | 0.59000 |
| HoPP Inj Domestic       | 0.68000 | 0.70000 |
| CoPP inj Domestic       | 0.71000 | 0.73000 |
| HDPE BM Domestic        | 0.53000 | 0.55000 |
| HDPE Inj Domestic       | 0.53000 | 0.55000 |
| LLDPE Film Domestic     | 0.50000 | 0.53000 |
| HMWPE Film Domestic     | 0.57000 | 0.59000 |
| LDPE Film Domestic      | 0.60000 | 0.62000 |
| HIPS Domestic           | 0.89000 | 0.93000 |
| GPPS Domestic           | 0.81000 | 0.85000 |

## Ethane (\$/gal) – Closing Price for Last 30 Days

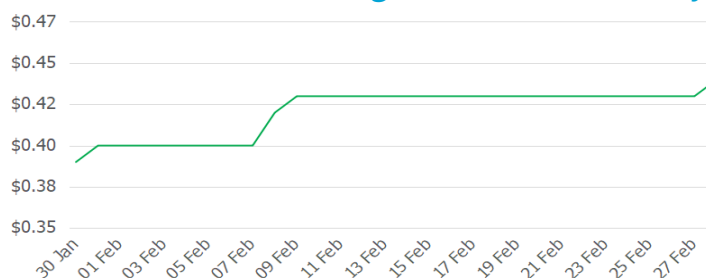


## Forward Curve Spreads (\$/lb)

| MONTH  | ETHYLENE ETHANE | HDPE BM ETHANE | PGP PROPANE | HoPP PROPANE |
|--------|-----------------|----------------|-------------|--------------|
| FEB 23 | 0.14861         | 0.36361        | 0.39556     | 0.36556      |
| MAR 23 | 0.14130         | 0.36130        | 0.39038     | 0.36038      |
| APR 23 | 0.13630         | 0.36130        | 0.31334     | 0.36334      |
| MAY 23 | 0.13193         | 0.36193        | 0.27334     | 0.36334      |
| JUN 23 | 0.12756         | 0.36256        | 0.26040     | 0.36290      |
| JUL 23 | 0.13069         | 0.36319        | 0.25980     | 0.36230      |
| AUG 23 | 0.13194         | 0.36319        | 0.25877     | 0.36127      |
| SEP 23 | 0.13109         | 0.36109        | 0.25905     | 0.35905      |
| OCT 23 | 0.12835         | 0.35835        | 0.26294     | 0.35669      |
| NOV 23 | 0.12582         | 0.35582        | 0.26587     | 0.35462      |
| DEC 23 | 0.12330         | 0.35330        | 0.27079     | 0.35329      |
| JAN 24 | 0.12826         | 0.34951        | 0.27234     | 0.35359      |

Ethylene = FOB MtB-EPC, HDPE BM = FOB Houston, Ethane = FOB MtB-EPC  
 PGP = FOB MtB-EPC, Propane = FOB MtB-TET, HoPP = FOB Houston

## HDPE BM (\$/lb) – Closing Price for Last 30 Days



## Closing Spreads (\$/lb)

| PRODUCT                       | PRICE    |
|-------------------------------|----------|
| Ethylene - (Ethane x. 0.422)  | 0.12926  |
| Ethylene - (Ethane div. 2.97) | 0.14861  |
| Ethylene - Propane            | 0.03056  |
| Ethylene - Butane             | -0.01473 |
| Ethylene - Natural gasoline   | -0.07627 |
| Ethylene - PGP                | -0.36500 |
| Ethylene - RGP                | 0.00500  |
| RGP - Propane                 | 0.02556  |
| PGP - RGP                     | 0.37000  |
| LDPE Film - Ethylene          | 0.38500  |
| LLDPE Film - Ethylene         | 0.29000  |
| HDPE Blow Mold - Ethylene     | 0.31500  |
| HDPE Inj - Ethylene           | 0.31500  |
| HDPE HMW - Ethylene           | 0.35500  |
| LDPE Film - Ethane            | 0.53361  |
| LLDPE Film - Ethane           | 0.43861  |
| HDPE Blow Mold - Ethane       | 0.46361  |
| HDPE Inj - Ethane             | 0.46361  |
| HDPE HMW - Ethane             | 0.50361  |
| HoPP Inj - RGP                | 0.47000  |
| CoPP - RGP                    | 0.50000  |
| HoPP Inj - Propane            | 0.49556  |
| CoPP - Propane                | 0.52556  |
| GPPS - Benzene                | 0.32685  |
| GPPS - Ethylene               | 0.60500  |
| HIPS - Benzene                | 0.40685  |
| HIPS - Ethylene               | 0.68500  |

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

## Closing Forward Curves (\$/lb)

| FORWARD MONTH | ETHANE BASED COST | PROPANE BASED COST | BUTANE BASED COST | C5 -BASED COST | ETHYLENE MtB-EPC | ETHYLENE Choc | PGP FOB MtB-EPC | HDPE FOB Hou | LLDPE FOB Hou | HoPP FOB Hou | HDPE FOB Chi | LLDPE FOB Chi | HoPP FOB Chi |
|---------------|-------------------|--------------------|-------------------|----------------|------------------|---------------|-----------------|--------------|---------------|--------------|--------------|---------------|--------------|
| FEB 23        | 0.08727           | 0.19167            | 0.32551           | 0.38827        | 0.22500          | 0.18250       | 0.59000         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| MAR 23        | 0.09014           | 0.20185            | 0.27606           | 0.39301        | 0.22000          | 0.18250       | 0.59000         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| APR 23        | 0.09328           | 0.21475            | 0.26878           | 0.43825        | 0.21500          | 0.18250       | 0.51000         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| MAY 23        | 0.09365           | 0.22428            | 0.25884           | 0.45491        | 0.21000          | 0.18250       | 0.47000         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| JUN 23        | 0.09297           | 0.22808            | 0.25479           | 0.45772        | 0.20500          | 0.18250       | 0.45750         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| JUL 23        | 0.09211           | 0.22936            | 0.25336           | 0.45620        | 0.20750          | 0.18500       | 0.45750         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| AUG 23        | 0.09219           | 0.23164            | 0.25404           | 0.45469        | 0.20875          | 0.18500       | 0.45750         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| SEP 23        | 0.09459           | 0.23536            | 0.25562           | 0.45254        | 0.21000          | 0.18500       | 0.46000         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| OCT 23        | 0.09706           | 0.23777            | 0.25634           | 0.44854        | 0.21000          | 0.18500       | 0.46625         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| NOV 23        | 0.09934           | 0.23996            | 0.25625           | 0.44353        | 0.21000          | 0.18500       | 0.47125         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| DEC 23        | 0.10191           | 0.24081            | 0.25584           | 0.43846        | 0.21000          | 0.18500       | 0.47750         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| JAN 24        | 0.10689           | 0.24036            | 0.25507           | 0.43651        | 0.21875          | 0.18500       | 0.47875         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| FEB 24        | 0.10662           | 0.23595            | 0.24932           | 0.43230        | 0.21875          | 0.18625       | 0.48000         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| MAR 24        | 0.10349           | 0.21963            | 0.23002           | 0.42304        | 0.21875          | 0.18750       | 0.48125         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| APR 24        | 0.09683           | 0.20279            | 0.20951           | 0.40781        | 0.22625          | 0.18875       | 0.48625         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| MAY 24        | 0.09543           | 0.19288            | 0.19957           | 0.39681        | 0.22625          | 0.19000       | 0.49125         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| JUN 24        | 0.09624           | 0.18913            | 0.19636           | 0.38768        | 0.22625          | 0.19125       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| JUL 24        | 0.09782           | 0.18964            | 0.19699           | 0.38203        | 0.23375          | 0.19250       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| AUG 24        | 0.10070           | 0.19085            | 0.19778           | 0.37506        | 0.23375          | 0.19375       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| SEP 24        | ---               | ---                | ---               | ---            | 0.23375          | 0.19500       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| OCT 24        | ---               | ---                | ---               | ---            | 0.24125          | 0.19500       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| NOV 24        | ---               | ---                | ---               | ---            | 0.24125          | 0.19500       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| DEC 24        | ---               | ---                | ---               | ---            | 0.24125          | 0.19500       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| JAN 25        | ---               | ---                | ---               | ---            | 0.24125          | 0.19500       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |
| FEB 25        | ---               | ---                | ---               | ---            | 0.24125          | 0.19500       | 0.49500         | 0.44000      | 0.43000       | 0.56000      | 0.53000      | 0.49000       | 0.65000      |

FOB = Free on Board. MtB = Mont Belvieu. Choc = Choctaw. Hou = Houston. Chi = Chicago. For a full methodology, visit [www.opisnet.com/about/methodology/#pcw](http://www.opisnet.com/about/methodology/#pcw)

## Spot Ethylene Trade Data

| CALENDAR AVERAGES | MTD FEB | JAN     | CHANGE   |
|-------------------|---------|---------|----------|
| 30-Day MtB-EPC    | 0.21921 | 0.21006 | 0.00915  |
| 30-Day Choctaw    | 0.17941 | 0.18413 | -0.00472 |

| WEIGHTED AVERAGES | MTD MAR | MTD FEB | JAN     |
|-------------------|---------|---------|---------|
| 30-Day MtB-EPC    | ---     | 0.21963 | 0.20785 |
| 30-Day TX-Other   | ---     | 0.22045 | 0.22431 |
| 30-Day TX All     | ---     | 0.21969 | 0.21423 |
| 30-Day LA All     | ---     | 0.17986 | 0.18391 |
| 30-Day TX/LA      | ---     | 0.20893 | 0.20637 |
| 45-Day MtB-EPC    | 0.22159 | 0.21984 | 0.20385 |
| 45-Day TX-Other   | 0.23013 | 0.22115 | 0.22326 |
| 45-Day TX All     | 0.22825 | 0.22004 | 0.20984 |
| 45-Day LA All     | 0.18300 | 0.17986 | 0.18256 |
| 45-Day TX/LA      | 0.21317 | 0.21047 | 0.20251 |

| SPOT VOLUMES (MM LBS)          | MTD FEB | JAN   |
|--------------------------------|---------|-------|
| Current Mo. Phys 30d - TX & LA | 411.0   | 540.0 |
| Current Mo. Phys 30d - TX only | 300.0   | 400.0 |
| Current Mo. Phys 30d - LA only | 111.0   | 140.0 |
| Current Mo. Phys 45d - TX & LA | 466.0   | 718.0 |
| Current Mo. Phys 45d - TX only | 355.0   | 525.0 |
| Current Mo. Phys 45d - LA only | 111.0   | 193.0 |
| Next Month Phys 45d - TX & LA  | 75.0    | 55.0  |
| Forward Phys - TX & LA         | 89.0    | 144.0 |
| Spreads Phys - TX & LA         | 359.0   | 350.0 |
| Index Phys - TX & LA           | 188.0   | 198.0 |
| All Paper                      | 27.0    | 49.0  |

| TODAY'S TRADING RANGES | LOW     | HIGH    | MIDPOINT |
|------------------------|---------|---------|----------|
| Ethylene TX            | 0.22500 | 0.22500 | 0.22500  |
| Ethylene LA            | 0.18250 | 0.18250 | 0.18250  |

| MTD TRADING RANGES | LOW     | HIGH    | MIDPOINT |
|--------------------|---------|---------|----------|
| Ethylene TX        | 0.21000 | 0.23250 | 0.22125  |
| Ethylene LA        | 0.16750 | 0.19000 | 0.17875  |

## Spot Ethylene Trades

| TRADE DATE | DEAL TYPE | PRICE                 | DELIVERY TIME | SYSTEM   | MODE |
|------------|-----------|-----------------------|---------------|----------|------|
| 02/28/2023 | INDEX     | OPIS Ethane + 0.11625 | Mar'23        | MtB-EPC  | PIPE |
| 02/28/2023 | SPREAD    | 0.00750               | Mar'23/Apr'23 | MtB-EPC  | PIPE |
| 02/28/2023 | PHYSICAL  | 0.22500               | Mar'23        | MtB-EPC  | PIPE |
| 02/28/2023 | PHYSICAL  | 0.22500               | Mar'23        | MtB-EPC  | PIPE |
| 02/28/2023 | PHYSICAL  | 0.22500               | Feb'23        | MtB-EPC  | PIPE |
| 02/28/2023 | PHYSICAL  | 0.18250               | Feb'23        | Choctaw  | PIPE |
| 02/28/2023 | PHYSICAL  | 0.22500               | Mar'23        | TX-Other | PIPE |
| 02/28/2023 | PHYSICAL  | 0.18250               | Mar'23        | Choctaw  | PIPE |
| 02/28/2023 | PAPER     | 0.22000               | Mar'23        | MtB-EPC  | PIPE |
| 02/28/2023 | PHYSICAL  | 0.18250               | Mar'23        | Choctaw  | PIPE |
| 02/28/2023 | PHYSICAL  | 0.23500               | Mar'23        | TX-Other | PIPE |
| 02/27/2023 | INDEX     | OPIS Ethane + 0.11000 | Q2'23         | MtB-EPC  | PIPE |
| 02/27/2023 | PHYSICAL  | 0.22625               | Feb'23        | MtB-EPC  | PIPE |
| 02/27/2023 | PHYSICAL  | 0.22625               | Feb'23        | MtB-EPC  | PIPE |
| 02/27/2023 | PHYSICAL  | 0.22750               | Feb'23        | MtB-EPC  | PIPE |
| 02/27/2023 | SPREAD    | 0.01000               | Feb'23/Mar'23 | MtB-EPC  | PIPE |
| 02/27/2023 | PHYSICAL  | 0.22625               | Feb'23        | MtB-EPC  | PIPE |
| 02/24/2023 | PHYSICAL  | 0.18250               | Mar'23        | Choctaw  | PIPE |
| 02/24/2023 | PHYSICAL  | 0.18250               | Mar'23        | Choctaw  | PIPE |
| 02/24/2023 | PHYSICAL  | 0.22500               | Feb'23        | MtB-EPC  | PIPE |
| 02/24/2023 | PHYSICAL  | 0.22500               | Feb'23        | MtB-EPC  | PIPE |
| 02/24/2023 | PHYSICAL  | 0.22500               | Feb'23        | MtB-EPC  | PIPE |
| 02/24/2023 | PHYSICAL  | 0.22500               | Feb'23        | MtB-EPC  | PIPE |
| 02/24/2023 | SPREAD    | 0.00875               | Feb'23/Mar'23 | MtB-EPC  | PIPE |
| 02/24/2023 | INDEX     | OPIS Ethane + 0.11250 | Mar'23        | MtB-EPC  | PIPE |

## Spot PGP Trade Data

| TODAY'S TRADING RANGES | LOW | HIGH | MIDPOINT |
|------------------------|-----|------|----------|
| PGP MtB-EPC            | --- | ---  | ---      |
| PGP TX Non-MtB         | --- | ---  | ---      |

| MTD TRADING RANGES | LOW     | HIGH    | MIDPOINT |
|--------------------|---------|---------|----------|
| PGP MtB-EPC        | 0.43000 | 0.53000 | 0.48000  |
| PGP TX Non-MtB     | 0.42500 | 0.51000 | 0.46750  |

| CALENDAR AVERAGES | MTD FEB | JAN     | CHANGE  |
|-------------------|---------|---------|---------|
| 30-Day MtB-EPC    | 0.50618 | 0.43013 | 0.07606 |

| WEIGHTED AVERAGES | MTD MAR | MTD FEB | JAN     |
|-------------------|---------|---------|---------|
| 30-Day MtB-EPC    | ---     | 0.49772 | 0.42428 |
| 30-Day TX All     | ---     | 0.49250 | 0.42298 |
| 45-Day MtB-EPC    | ---     | 0.49163 | 0.41904 |
| 45-Day TX All     | ---     | 0.48760 | 0.41446 |

| SPOT VOLUMES (MM LBS) | MTD FEB | JAN   |
|-----------------------|---------|-------|
| Current Mo. Phys 30d  | 94.0    | 214.5 |
| Current Mo. Phys 45d  | 102.0   | 235.5 |
| Next Month Phys 45d   | 0.0     | 8.0   |
| Forward Phys          | 6.0     | 33.0  |
| Spreads Phys          | 14.5    | 73.7  |
| Index Phys            | 8.0     | 15.0  |
| All Paper             | 63.9    | 110.0 |

## Spot Polymer Grade Propylene Trades

| TRADE DATE | DEAL TYPE | PRICE   | DELIVERY TIME | SYSTEM  | MODE |
|------------|-----------|---------|---------------|---------|------|
| 02/28/2023 | PAPER     | 0.53000 | Mar'23        | MtB-EPC | PIPE |
| 02/28/2023 | PAPER     | 0.06000 | Mar'23-Apr'23 | MtB-EPC | PIPE |
| 02/28/2023 | PAPER     | 0.54250 | Mar'23        | MtB-EPC | PIPE |
| 02/28/2023 | PAPER     | 0.49000 | Apr'23        | MtB-EPC | PIPE |
| 02/28/2023 | PAPER     | 0.49000 | Apr'23        | MtB-EPC | PIPE |
| 02/28/2023 | PAPER     | 0.57500 | Mar'23        | MtB-EPC | PIPE |
| 02/27/2023 | PAPER     | 0.52250 | Mar'23        | MtB-EPC | PIPE |
| 02/27/2023 | PAPER     | 0.52250 | Mar'23        | MtB-EPC | PIPE |
| 02/24/2023 | PAPER     | 0.50000 | Mar'23        | MtB-EPC | PIPE |
| 02/24/2023 | SPREAD    | 0.06000 | Feb'23/Mar'23 | MtB-EPC | PIPE |
| 02/23/2023 | PAPER     | 0.48500 | Mar'23        | MtB-EPC | PIPE |
| 02/23/2023 | PAPER     | 0.48500 | Mar'23        | MtB-EPC | PIPE |
| 02/23/2023 | SPREAD    | 0.05000 | Feb'23/Mar'23 | MtB-EPC | PIPE |
| 02/22/2023 | PAPER     | 0.43000 | 2H'23         | MtB-EPC | PIPE |
| 02/22/2023 | PAPER     | 0.43000 | 2H'23         | MtB-EPC | PIPE |
| 02/22/2023 | PHYSICAL  | 0.50500 | Feb'23        | MtB-EPC | PIPE |
| 02/22/2023 | PHYSICAL  | 0.51000 | Feb'23        | MtB-EPC | PIPE |
| 02/22/2023 | PHYSICAL  | 0.51000 | Feb'23        | MtB-EPC | PIPE |
| 02/21/2023 | PHYSICAL  | 0.50500 | Feb'23        | MtB-EPC | PIPE |
| 02/21/2023 | PHYSICAL  | 0.50500 | Feb'23        | MtB-EPC | PIPE |
| 02/21/2023 | PAPER     | 0.43000 | Q2'23         | MtB-EPC | PIPE |
| 02/21/2023 | PAPER     | 0.43000 | Q2'23         | MtB-EPC | PIPE |
| 02/21/2023 | PAPER     | 0.43000 | Q2'23         | MtB-EPC | PIPE |
| 02/20/2023 | PHYSICAL  | 0.50500 | Feb'23        | MtB-EPC | PIPE |
| 02/17/2023 | PHYSICAL  | 0.50000 | Feb'23        | MtB-EPC | PIPE |
| 02/16/2023 | PHYSICAL  | 0.50500 | Feb'23        | MtB-EPC | PIPE |
| 02/16/2023 | PHYSICAL  | 0.50500 | Feb'23        | MtB-EPC | PIPE |
| 02/16/2023 | PHYSICAL  | 0.50500 | Feb'23        | MtB-EPC | PIPE |
| 02/15/2023 | PHYSICAL  | 0.52000 | Feb'23        | MtB-EPC | PIPE |
| 02/15/2023 | PAPER     | 0.43000 | Q2'23         | MtB-EPC | PIPE |

## Spot RGP Trade Data

| TODAY'S TRADING RANGES | LOW  | HIGH | MIDPOINT |
|------------------------|------|------|----------|
| RGP MtB-E              | ---- | ---- | ----     |
| RGP TX Non-MtB         | ---- | ---- | ----     |
| RGP Non-TX             | ---- | ---- | ----     |

| MTD TRADING RANGES | LOW  | HIGH | MIDPOINT |
|--------------------|------|------|----------|
| RGP MtB-E          | ---- | ---- | ----     |
| RGP TX Non-MtB     | ---- | ---- | ----     |
| RGP Non-TX         | ---- | ---- | ----     |

| CALENDAR AVERAGES | MTD FEB | JAN     | CHANGE  |
|-------------------|---------|---------|---------|
| 30-Day RGP Pipe   | 0.20632 | 0.18225 | 0.02407 |

| WEIGHTED AVERAGES    | MTD MAR | MTD FEB | JAN     |
|----------------------|---------|---------|---------|
| 30-Day Pipe MtB-E    | ----    | ----    | 0.15250 |
| 30-Day All TX        | ----    | ----    | 0.28484 |
| 30-Day All TX/Non-TX | ----    | ----    | 0.28484 |
| 45-Day Pipe MtB-E    | ----    | 0.18000 | 0.15917 |
| 45-Day All TX        | ----    | 0.18000 | 0.19059 |
| 45-Day All TX/Non-TX | ----    | 0.18000 | 0.19059 |

| SPOT VOLUMES (K BBLs) | MTD FEB | JAN   |
|-----------------------|---------|-------|
| Current Mo. Pipe 30d  | 0.0     | 0.0   |
| Current Mo. Pipe 45d  | 125.0   | 150.0 |
| Next Month Pipe 45d   | 0.0     | 125.0 |
| Current Mo. All 30d   | 0.0     | 43.4  |
| Current Mo. All 45d   | 125.0   | 203.9 |
| Next Month All 45d    | 0.0     | 125.0 |
| Forward Phys          | 0.0     | 125.0 |
| Spreads Phys          | 0.0     | 0.0   |
| Index Phys            | 0.0     | 0.0   |

## Spot Refinery Grade Propylene Trades

| TRADE DATE | DEAL TYPE | PRICE   | DELIVERY TIME | SYSTEM   | MODE |
|------------|-----------|---------|---------------|----------|------|
| 01/31/2023 | PHYSICAL  | 0.18000 | Feb'23        | MtB-EPC  | PIPE |
| 01/30/2023 | PHYSICAL  | 0.18000 | Feb'23        | MtB-EPC  | PIPE |
| 01/27/2023 | PHYSICAL  | 0.18000 | Feb'23        | MtB-EPC  | PIPE |
| 01/20/2023 | PHYSICAL  | 0.29000 | Jan'23        | TX-Other | RAIL |
| 01/18/2023 | PHYSICAL  | 0.29000 | Jan'23        | TX-Other | RAIL |

## Steam Cracker Shutdown Summary

| MTD EST ETHYLENE OUTPUT |           | MTD OVERALL OPERATING RATES |         | YTD OVERALL OPERATING RATES |         | YTD EST ETHYLENE OUTPUT |            |
|-------------------------|-----------|-----------------------------|---------|-----------------------------|---------|-------------------------|------------|
| MTD Max GC Capacity     | 6.91490 B | Texas                       | 93.85%  | Texas                       | 90.87%  | YTD Max GC Capacity     | 14.57069 B |
| MTD Est GC Output       | 6.60695 B | Louisiana                   | 100.00% | Louisiana                   | 100.00% | YTD Est GC Output       | 13.60784 B |
| MTD LBS OUT             | 0.30795 B | Gulf Coast                  | 95.55%  | Gulf Coast                  | 93.39%  | YTD LBS OUT             | 0.96285 B  |

| CURRENT OUTAGES            | SITE                    | MM LBS/DAY | % COUNTRY | START DATE | STATUS     | PLANNED | TOTAL DAYS DOWN | EST. MM LBS OUT |
|----------------------------|-------------------------|------------|-----------|------------|------------|---------|-----------------|-----------------|
| Formosa Plastics Corp. USA | Point Comfort Olefins I | 4.10959    | 1.62%     | 20-Jul-22  | Shut       | P       | 224             | 920.54816       |
| Bayport Polymers           | Port Arthur             | 6.04005    | 2.37%     | 01-Aug-21  | Restarting | P       | 577             | 3484.76265      |
| Eastman Chemical Co.       | Longview HCC-3          | 0.84932    | 0.33%     | 15-Oct-18  | Idle       | P       | 1598            | 1357.21336      |

| PAST OUTAGES                     | SITE                        | MM LBS/DAY | % COUNTRY | START DATE | END DATE  | PLANNED | TOTAL DAYS DOWN | EST. MM LBS OUT |
|----------------------------------|-----------------------------|------------|-----------|------------|-----------|---------|-----------------|-----------------|
| Motiva                           | Port Arthur Olefins         | 3.69863    | 1.45%     | end-Jan-23 | 31-Jan-23 | U       | Reduced         | 14.79456        |
| Equistar Chemicals LP            | Corpus Christi Olefins      | 6.84932    | 2.69%     | 23-Dec-22  | 31-Jan-23 | P       | 40              | 273.94560       |
| Dow Chemical Co.                 | Freeport TX-7               | 4.41096    | 1.73%     | 23-Dec-22  | 10-Jan-23 | U       | 19              | 83.79988        |
| Shell Chemicals Ltd.             | Deer Park Olefins Plant-II  | 2.19178    | 0.86%     | 22-Dec-22  | 06-Jan-23 | P       | 16              | 35.06496        |
| Shell Chemicals Ltd.             | Deer Park Olefins Plant-III | 4.93151    | 1.94%     | 22-Dec-22  | 06-Jan-23 | P       | 16              | 78.89632        |
| Motiva                           | Port Arthur Olefins         | 3.69863    | 1.45%     | 23-Dec-22  | 31-Dec-22 | U       | 9               | 33.28434        |
| Chevron Phillips Chemical Co. LP | Cedar Bayou Olefins 1       | 5.04110    | 1.98%     | 20-Dec-22  | 31-Dec-22 | P       | 12              | 60.48720        |
| Chevron Phillips Chemical Co. LP | Cedar Bayou Olefins 2       | 9.04110    | 3.55%     | 20-Dec-22  | 31-Dec-22 | P       | 12              | 108.48240       |
| Chevron Phillips Chemical Co. LP | Cedar Bayou Olefins 2       | 9.04110    | 3.55%     | 26-Jul-22  | 04-Nov-22 | U       | 102             | 922.10040       |
| Chevron Phillips Chemical Co. LP | Cedar Bayou Olefins 1       | 5.04110    | 1.98%     | 26-Jul-22  | 14-Aug-22 | U       | 20              | 100.81200       |

### QUESTIONS

If you have questions about your subscription, please [contact us](#).

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Feb TX-Other railcar RGP was bid at 25 cpp against no offers. Mar was bid at 27 cpp against no offers. There have been no Feb TX-Other rail or truck RGP trades.

The calendar average for Feb MtB-EPC PGP was 50.618 cpp. The 30-day weighted average for Feb TX-All PGP was 49.25 cpp. The 45-day weighted average for Feb TX-All PGP was 48.76 cpp. The calendar average for Feb MtB-EPC pipeline RGP was 20.632 cpp. There have been no trades in the 30-day TX-All RGP window. The 45-day weighted average for Feb TX-All RGP was 18 cpp.

No olefins operations news or updates were confirmed.

--Julia Giordano, jgiordano@opisnet.com (olefins)

Feb and Mar spot styrene were unchanged at 50.80 cpp (\$1120/mt). Spot benzene ranges had Mar bid at 351 cpg DDP HTC and offered at 365 cpg DDP HTC. Apr was bid at 335 cpg DDP HTC and offered at 342 cpg DDP HTC.

--Anna Matherne, amatherne@opisnet.com (styrene and benzene)

Apr NYMEX crude settled at \$77.05/bbl, up \$1.37 from Monday's settle. Apr ICE Brent settled at \$83.89/bbl, up \$1.44. Apr NYMEX nat gas settled at \$2.747/mmBtu, up 1.6 cents.

Ethylene cash costs were mixed. Feb ethane-based costs were down 0.8 cent at 8.7 cpp. Feb propane-based costs were up 0.1 cent at 19.2 cpp. Feb butane-based costs were down 4.4 cpp at 32.6 cpp. The ethane-ethylene spread moved from 14.3 cpp to 14.9 cpp. The spread between ethane and HDPE BM (FOB Houston) was 1.6 cpp wider at 36.4 cpp. The propane-PGP spread moved from 37 cpp to 39.6 cpp. The spread between propane and HoPP raffia (FOB Houston) was 2.6 cpp wider at 36.6 cpp.

--Adam Burkin, aburkin@opisnet.com (energy futures, ethylene cash costs)

HDPE BM HIC for export was assessed at 44 cpp railcar FOB Houston based on indicated buying interest. LLDPE butene film was last seen at 43 cpp railcar FOB Houston; no Mar offers have been confirmed so far this week. HoPP raffia/IM for export to a few regional markets was last seen in the upper 50s cpp and low 60s cpp based on indicated monomer spreads. In Latin America, HoPP raffia selling prices were transitioning higher at \$1200-1300/mt (54.4-59 cpp) CFR WCSA. In the domestic secondary market, offgrade HDPE IM was seen as low as 42 cpp railcar delivered, but other offers were firm at 45-47 cpp. Offgrade LDPE liner was steady at around 44 cpp railcar delivered. LDPE C&A selling prices were 2-3 cpp higher at 41-42 cpp railcar delivered. Good quality offgrade HoPP IM was quoted at 53-55 cpp railcar delivered, but buying interest was limited. Buying interest for good quality offgrade impact CoPP was heard in the mid-50s cpp railcar delivered, but no availability was seen at this level. On the Dalian Commodity Exchange, LLDPE futures were flat at RMB8294/mt. HoPP futures were down RMB38/mt (-0.5%) at RMB7845/mt. In the PS contract market, a supplier announced a 3 cpp price increase, effective Mar 1.

--David Barry, dbarry@opisnet.com (polymers)

OPIS NEWS: New Plastic Recycling Technology from DOE Awaits Industry Interest

The US Department of Energy has created a new technology that can transform hard to recycle plastic waste like squeezable bottles into "gasoline-like fuel without unwanted byproducts," the agency's Pacific Northwest National Laboratory said on Friday.



The research was funded by DOE's Office of Science, which provided \$25 million in Sep 2021 for 10 projects focused on the recycling of plastics, Karyn Hede, the laboratory's senior science communicator and media relations advisor, said in an interview with OPIS on Monday.

"The way these awards are scoped [made], funding is dependent on progress," she said. "I can tell you that the first round of funding was scoped at \$500K to \$1.5 million."

The recent findings were published on Thursday in the journal Science.

What happens now is uncertain.

"Once we report a discovery, as was done in this Science research article, the next steps toward scale up are generally funded by industry," Hede said. "I can tell you that as of this time, we have no industry partner for scale up."

She added: "We do not have any proprietary technology interest (i.e., patent application) for this work. It is available for anyone to commercialize."

The efforts to find new ways to recycle plastic have grown in recent years in the US and elsewhere. Most plastic is recycled in a "mechanical" process whereby it is collected, sorted and converted into flake or pellet form for reuse.

The US plastic recycling rate is estimated at 5%-10% annually, depending on the source of estimates. It varies widely depending on plastic type. For instance, the national average recycling rate of bottles made from polyethylene terephthalate, the world's most widely used plastic, is estimated at about 28% and near 70% in California. The recycling rate of polypropylene plastic -- used to make yogurt cups, medicine vials, bottle caps and many other products -- is estimated at under 5%.

Recycling plastic waste through the chemical process of pyrolysis is a nontraditional method, which has gained traction in recent years. In pyrolysis, waste like plastic shrink wrap is converted into oils used as raw material at petrochemical plants to produce new plastic.

--Reporting by Xavier A Cronin, [xcronin@opisnet.com](mailto:xcronin@opisnet.com); Editing by Christie Citranglo, [ccitranglo@opisnet.com](mailto:ccitranglo@opisnet.com) and Donna Todd, [dtodd@opisnet.com](mailto:dtodd@opisnet.com)

#### OPIS NEWS: Chance of Back-to-Back, Extreme Hurricanes in US Grows

The chance of two hurricanes making landfalls close together along the US Gulf Coast and the East Coast within about two weeks has significantly increased, according to a research study by climate scientists at Princeton University.

There is also now a slight chance of "grey swan" events of two major hurricanes such as Katrina and Harvey impacting the US within 15 days of each other, according to the study that was published Monday on the website of Nature, a science journal for academics to share their research findings.

"We find that the chance of sequential tropical cyclone hazards has been increasing over the past several decades at many US locations," the study said.

A tropical cyclone is a term describing a rotating, organized storm system that originates over warm waters. Scientists and climatologists use the term tropical cyclone loosely when they refer to hurricanes, tropical storms and tropical depressions.

Also, the chance of two tropical cyclones inflicting hazards at the same location within 15 days may "substantially increase," with the return period decreasing to as frequently as every one to two years along the US East Coast and Gulf Coast, compared to every 10-92 years in the last century because of sea-level rise and the changing nature of storms, the study showed.

Storm surge, severe flooding due to torrential rain, dangerous wind and related power and water outages brought by hurricanes have in the past caused major disruptions at the dozens of complex and large coastal refineries on the US Gulf Coast.

The study also considered the possibility of two extreme "grey swan" events of historic hurricanes -- such as Hurricanes Harvey, Irma and Maria in 2017 -- impacting the US within 15 days or less, which have made dispatching limited rescue resources to the affected areas difficult.

According to the study, the scientists have investigated the chance of a Katrina-like (2005) hurricane, which caused storm surge of over 8 meters in at least one coastal location, and a Harvey-like cyclone (2017), which caused total rainfall of 1,000 mm (3.3 feet), impacting the US mainland in 15 days or less.

"Such sequential events cannot be found in the 1,375-year control simulation. However, such events may occur in the future," the study said.

The chance of hurricanes like Katrina and Harvey impacting the US coastline within 15 days of each other is now between 250 years and 85 years, under the two climate model assumptions used by the scientists, according to the study.

Dazhi Xi, Ning Lin and Avantika Gori at Princeton's Department of Civil and Environmental Engineering are the authors of the study titled "Increasing Sequential Tropical Cyclone Hazards Along the US East And Gulf Coasts."

--Reporting by Frank Tang, [ftang@opisnet.com](mailto:ftang@opisnet.com); Editing by Michael Kelly, [mkelly@opisnet.com](mailto:mkelly@opisnet.com) and Donna Todd, [dtodd@opisnet.com](mailto:dtodd@opisnet.com)