



RBN U.S. Propane Billboard

# U.S. Propane Market Update & Outlook

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## TABLE OF CONTENTS

|                                    |       |
|------------------------------------|-------|
| <a href="#">Summary</a>            | p. 1  |
| <a href="#">Inventories</a>        | p. 3  |
| <a href="#">Markets</a>            | p. 4  |
| <a href="#">Demand</a>             | p. 6  |
| <a href="#">Exports</a>            | p. 7  |
| <a href="#">Production</a>         | p. 9  |
| <a href="#">Infrastructure Map</a> | p. 10 |
| <a href="#">PADD Analysis</a>      | p. 11 |
| <a href="#">Prices</a>             | p. 16 |
| <a href="#">International</a>      | p. 18 |
| <a href="#">Appendix</a>           | p. 19 |

## U.S. PROPANE SUPPLY &amp; DEMAND

| Table A:                 | MM gal / month |              |              |              |              |              |              | M bbl / day  |              |              |              |              |              |              |
|--------------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                          | EIA MONTHLY    |              | ESTIMATED    |              | FORECAST     |              |              | EIA MONTHLY  |              | ESTIMATED    |              | FORECAST     |              |              |
|                          | Apr-23         | May-23       | Jun-23       | Jul-23       | Aug-23       | Sep-23       | Oct-23       | Apr-23       | May-23       | Jun-23       | Jul-23       | Aug-23       | Sep-23       | Oct-23       |
| Production               | 2,825          | 2,952        | 2,877        | 2,989        | 2,988        | 2,894        | 2,996        | 2,242        | 2,267        | 2,284        | 2,296        | 2,295        | 2,297        | 2,301        |
| Gas Plants               | 2,465          | 2,577        | 2,505        | 2,599        | 2,605        | 2,531        | 2,623        | 1,956        | 1,979        | 1,988        | 1,996        | 2,001        | 2,009        | 2,015        |
| Refinery                 | 360            | 375          | 373          | 390          | 383          | 363          | 373          | 286          | 288          | 296          | 299          | 294          | 288          | 286          |
| Imports                  | 101            | 86           | 89           | 88           | 86           | 86           | 109          | 80           | 66           | 70           | 68           | 66           | 68           | 84           |
| <b>TOTAL SUPPLY</b>      | <b>2,926</b>   | <b>3,038</b> | <b>2,966</b> | <b>3,077</b> | <b>3,074</b> | <b>2,980</b> | <b>3,105</b> | <b>2,322</b> | <b>2,333</b> | <b>2,354</b> | <b>2,364</b> | <b>2,361</b> | <b>2,365</b> | <b>2,385</b> |
| Demand (Prod. Supplied)  | 873            | 680          | 702          | 758          | 847          | 981          | 1,060        | 693          | 522          | 557          | 582          | 650          | 779          | 814          |
| Exports                  | 1,846          | 1,927        | 1,891        | 2,029        | 2,023        | 1,942        | 2,010        | 1,465        | 1,480        | 1,501        | 1,559        | 1,554        | 1,541        | 1,544        |
| Stock Change             | 208            | 432          | 372          | 290          | 204          | 57           | 34           | 165          | 332          | 295          | 223          | 157          | 45           | 26           |
| <b>TOTAL DISPOSITION</b> | <b>2,927</b>   | <b>3,039</b> | <b>2,965</b> | <b>3,078</b> | <b>3,074</b> | <b>2,980</b> | <b>3,105</b> | <b>2,323</b> | <b>2,334</b> | <b>2,353</b> | <b>2,364</b> | <b>2,361</b> | <b>2,365</b> | <b>2,385</b> |
| <b>TOTAL INVENTORY*</b>  | <b>2.6</b>     | <b>3.0</b>   | <b>3.4</b>   | <b>3.6</b>   | <b>3.9</b>   | <b>3.9</b>   | <b>3.9</b>   | <b>60.7</b>  | <b>71.0</b>  | <b>79.9</b>  | <b>86.8</b>  | <b>91.7</b>  | <b>93.0</b>  | <b>93.8</b>  |

\* Inventories are shown in billion gallons and million barrels respectively.

## MONTHLY HIGHLIGHTS

- Mont Belvieu propane prices were sharply higher, rebounding by 18 c/gal, or 34%, from the beginning of the month. Propane was also stronger relative to crude oil, with the ratio to WTI rising to 37% as of July 31, up 5 percentage points for the month.
- U.S. propane production set an all-time high for May 2023, according to the latest EIA monthly data released on July 31. Propane gas plant production for the month was 1,979 Mb/d, which was 19 Mb/d above the September 2022 record rate and 136 Mb/d, or 7.4%, higher than May 2022.
- Propane exports were also strong in July at 1,559 Mb/d, which was 270 Mb/d, or 21%, higher than the July 2022 rate. The U.S.-Asia export arbitrage margin for propane widened during the month as the Asian FEI-Mont Belvieu price spread increased.
- Total U.S. propane stocks built by 6.9 MMbbl in July, in line with our estimate, driven by a large build in PADD 1 (East Coast). This brings ending stocks for the month to 86.8 MMbbl (3.6 Bgal), which is 22.7 MMbbl, or 35%, above last year and 23% higher than the 5-year average. (See the Monthly Market Spotlight section of this report, where we look at the July PADD 1 inventory build.)

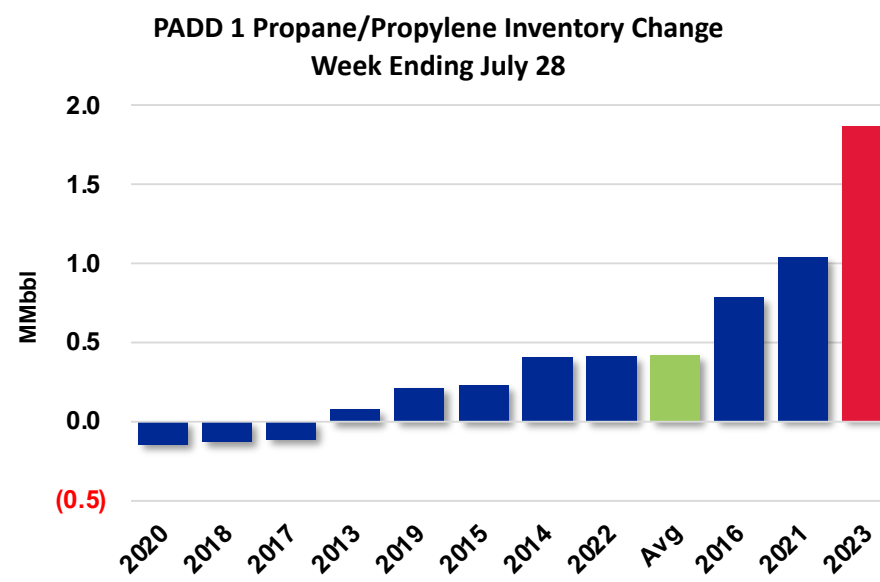
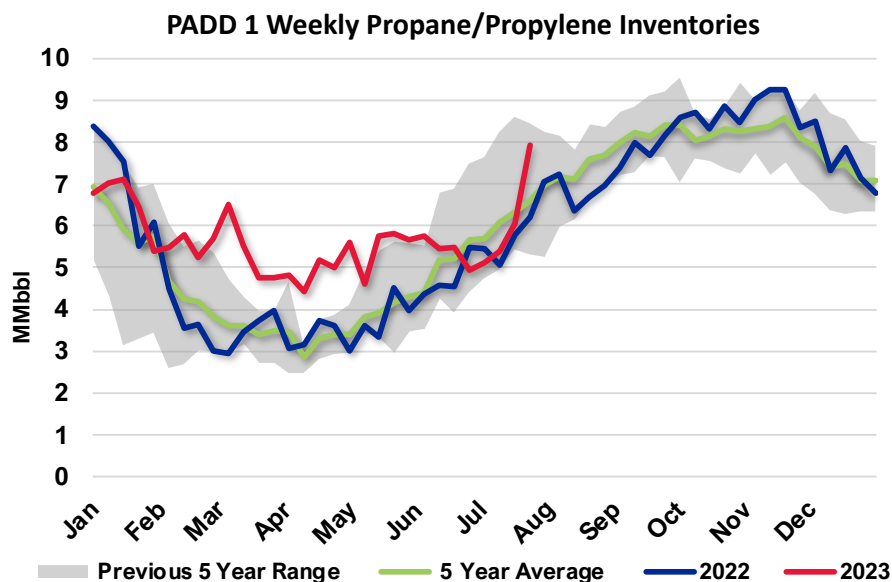
## MARKET OVERVIEW

Stronger propane prices, robust exports and modest inventory builds were the main market themes in July. Total U.S. propane stocks remain well above last year and the 5-year average, but the inventory cushion has started to shrink. Propane prices rebounded sharply during the month, partially due to higher crude oil prices, with Mont Belvieu propane trading above 70 c/gal on July 31, up nearly 35% from the beginning of the month. There was some good news as the EIA reported that U.S. propane production hit an all-time high for May 2023. Propane gas plant production was 19 Mb/d above the September 2022 record high and up 136 Mb/d year-on-year, or 7.4%, and we expect output to continue to grow by 8-10 Mb/d per month for the rest of the year. Exports were also strong with July year-to-date exports averaging 1,530 Mb/d, up 158 Mb/d, or 11.5%, from the same period in 2022.

## MONTHLY PROPANE MARKET SPOTLIGHT

### RECORD-HIGH PADD 1 (EAST COAST) WEEKLY INVENTORY BUILD

The EIA reported that PADD 1 propane/propylene inventories grew by 1.9 MMbbl (red line, left-hand chart) for week ended July 28, which was the largest weekly increase on record for the region. The increase in propane stocks for the week (red bar, right-hand chart) was about 1.4 MMbbl more than the average increase of 422 Mbbl (green bar, right-hand chart). The large build brought total weekly propane/propylene stocks for the region to 7.9 MMbbl, which is 1.3 MMbbl, or 19.9%, above the 5-year average (green line, left-hand chart).



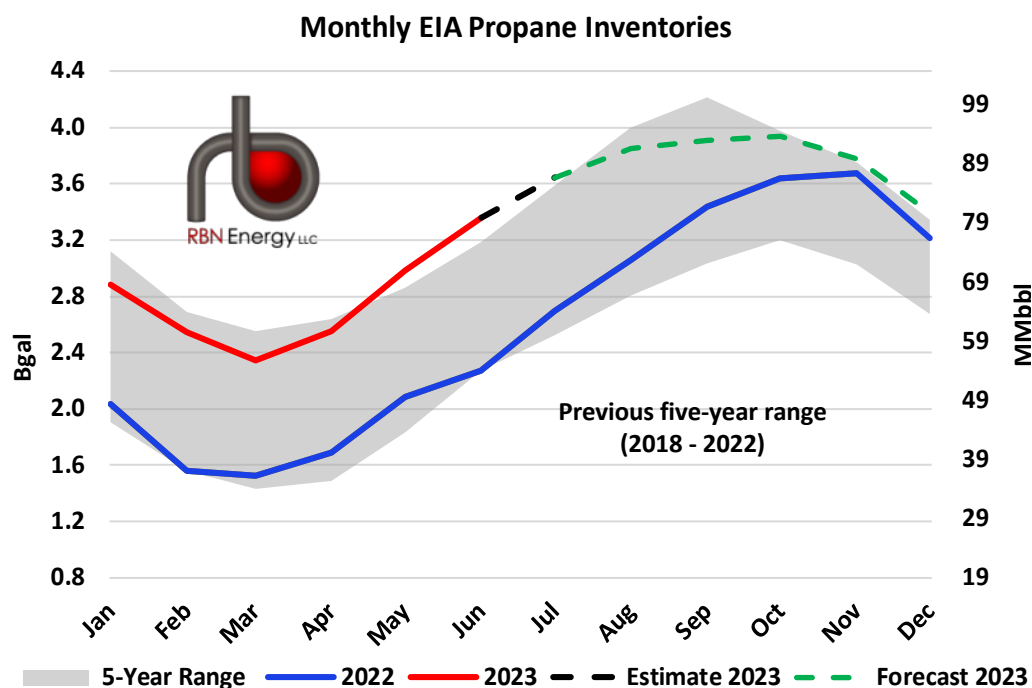
Source: EIA, RBN

Weekly inventory builds for the East Coast rarely exceed 1 MMbbl, occurring only seven times since 2011. We believe the usually large weekly build is likely an aberration with the EIA data. Accordingly, we have reduced our projection for July PADD 1 monthly stocks in the RBN propane forecast model by 1 MMbbl. It should be noted that we also remove estimated propylene stocks (about 100 Mbbl) from the weekly data in our monthly model. These adjustments bring our July ending inventory estimate for the region to 6.8 MMbbl, which is 1.1 MMbbl lower than the EIA weekly data.

## U.S. PROPANE INVENTORIES

| Table B:                 |             | MM gal |      |           |        |          | M bbl       |        |        |           |        |          |
|--------------------------|-------------|--------|------|-----------|--------|----------|-------------|--------|--------|-----------|--------|----------|
|                          | MONTHLY EIA |        |      | ESTIMATED |        | FORECAST | MONTHLY EIA |        |        | ESTIMATED |        | FORECAST |
|                          | Apr-23      | May-23 | M/M  | Jun-23    | Jul-23 | Aug-23   | Apr-23      | May-23 | M/M    | Jun-23    | Jul-23 | Aug-23   |
| PADD 1 (East Coast)      | 236         | 220    | (16) | 202       | 285    | 307      | 5,620       | 5,243  | (377)  | 4,821     | 6,791  | 7,308    |
| PADD 2 (Midwest)         | 557         | 727    | 171  | 862       | 949    | 1,037    | 13,252      | 17,317 | 4,065  | 20,522    | 22,600 | 24,680   |
| PADD 3 (Gulf Coast)      | 1,647       | 1,887  | 240  | 2,097     | 2,196  | 2,279    | 39,219      | 44,938 | 5,719  | 49,929    | 52,285 | 54,255   |
| PADD 4 (Rocky Mountains) | 82          | 96     | 13   | 127       | 140    | 142      | 1,963       | 2,279  | 316    | 3,032     | 3,342  | 3,392    |
| PADD 5 (West Coast)      | 29          | 53     | 25   | 67        | 75     | 86       | 680         | 1,270  | 590    | 1,601     | 1,798  | 2,045    |
| TOTAL PROPANE            | 2,551       | 2,984  | 433  | 3,356     | 3,646  | 3,851    | 60,734      | 71,047 | 10,313 | 79,905    | 86,815 | 91,680   |
| Propylene                | 54          | 48     | (6)  | 51        | 51     | 52       | 1,279       | 1,147  | (132)  | 1,215     | 1,207  | 1,238    |
| TOTAL INVENTORIES        | 2,605       | 3,032  | 428  | 3,407     | 3,697  | 3,903    | 62,013      | 72,194 | 10,181 | 81,119    | 88,022 | 92,918   |

Figure 1.1



Source: EIA

## ANALYSIS &amp; INSIGHTS

U.S. propane inventories built by 6.9 MMbbl during the fourth month of the injection season, which was well below the 10-MMbbl build in July 2022 but in line with the 5-year average increase for the month of 7.4 MMbbl, bringing ending stocks for July to 86.8 MMbbl (3.6 Bgal), which is 22.7 MMbbl, or 35%, above last year and 23% higher than the 5-year average. PADD 3 had a modest build of 2.4 MMbbl for the month, which was on par with the 2.6 MMbbl average increase for the period. Gulf Coast inventories remain elevated and are 13.1 MMbbl, or 33%, above the 5-year average. PADD 2 inventories rose by 2.1 MMbbl, which was below the 3.2 MMbbl average gain for the month. Midwest stocks are 3.2 MMbbl, or 20%, above last year and 1.8 MMbbl higher than the 5-year average. PADD 1 inventories increased by 2 MMbbl, which was well above the 5-year average build of 0.9 MMbbl. PADD 4 stocks rose by 0.3 MMbbl to 3.3 MMbbl, which is 894 Mbbl above last year and 1.2 MMbbl higher than the 5-year average. PADD 5 inventories increased by 0.2 MMbbl to 1.8 MMbbl, which is 37 Mbbl, or 2%, above the 5-year average.

## INVENTORY OUTLOOK

U.S. propane inventories in August are projected to build by 4.9 MMbbl, which is 3.8 MMbbl below the 5-year average gain. This would bring total stocks to 91.7 MMbbl (3.9 Bgal), which is 19 MMbbl more than last year and 12.6 MMbbl above the 5-year average.



## PROPANE MARKET UPDATE

## MONT BELVIEU PROPANE PRICES REBOUND

West Texas Intermediate (WTI) prices rallied to a three-month high during July and recorded their steepest monthly gains since January 2022, supported by signs of tightening global supply and rising demand through the rest of this year. WTI closed at \$81.80/bbl on July 31, up \$11.16/bbl, or 16%, from July 1.

U.S. propane prices were stronger than crude, soaring by 34% during the month. OPIS non-LST (Enterprise, aka non-TET) propane averaged 62.1 c/gal in July, settling at 72.2 c/gal on July 31, up 18.2 c/gal from the beginning of the month. OPIS LST (Energy Transfer, aka TET) propane prices averaged 63.7 c/gal for the month, closing at 74 c/gal on July 31, an increase of 19 c/gal from the beginning of the month. The non-TET vs. TET price spread increased by 0.8 c/gal during the month, with non-TET trading at a discount of 1.8 c/gal on July 31. Conway OPIS propane averaged 60.4 c/gal during the month, which represented a 1.7 c/gal discount to the average non-LST price.

The benchmark propane-to-WTI Cushing ratio settled at 37% as of July 31, up 5 percentage points from July 1. The current forward curves project the propane-to-WTI ratio to average around 39% through October, which is 5 percentage points higher than implied by the forward curves from last month. As shown in Figure 1.3, the forward curve for August (red line) shifted up sharply, rising by about 20 c/gal from the forward curve in July (yellow line).

Figure 1.2

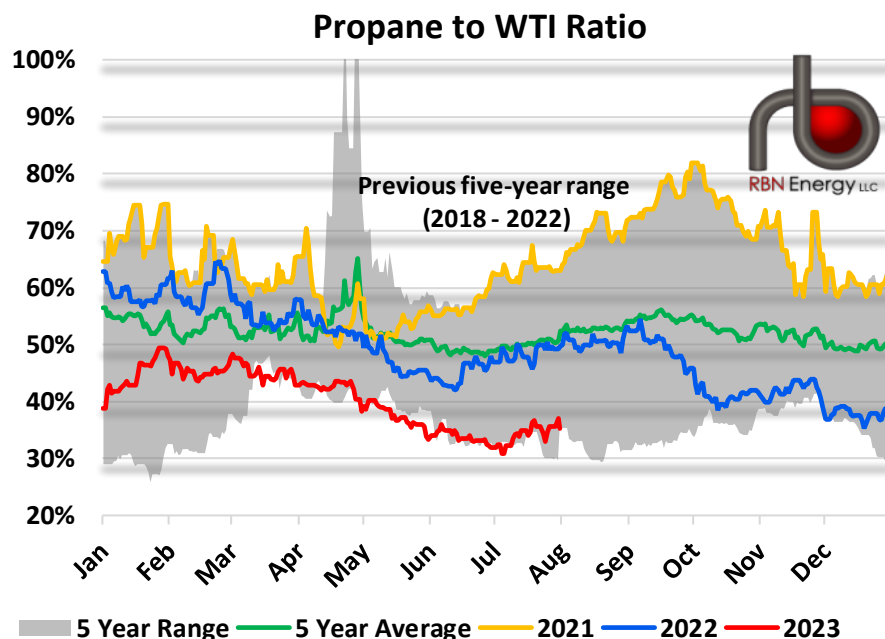
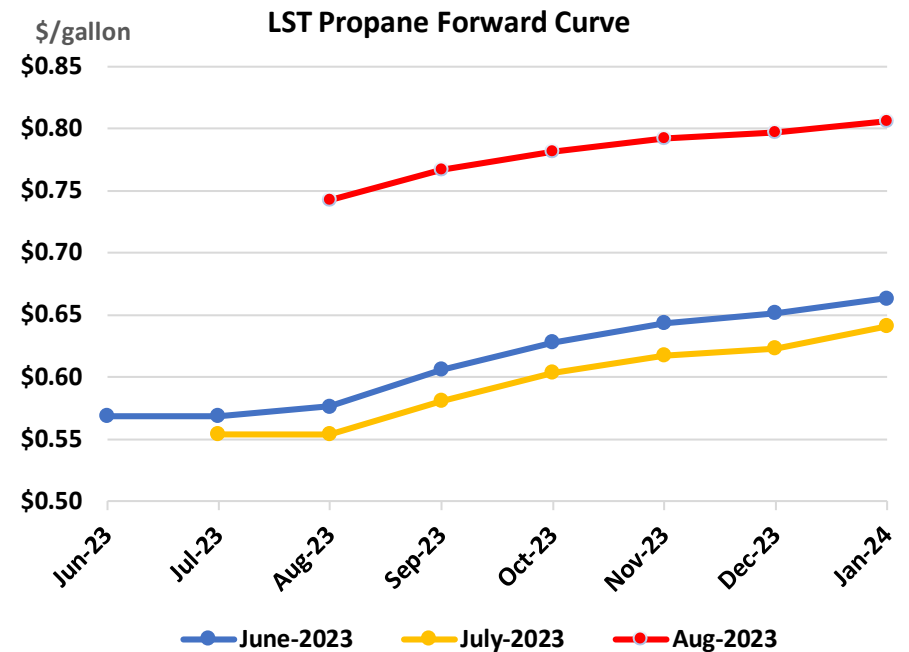


Figure 1.3



## CONWAY VS. MONT BELVIEU PROPANE PRICES

Figure 2.5

### CONWAY DISCOUNT TO BELVIEU RELATIVELY UNCHANGED

The Conway spot propane (OPIS) average discount to Mont Belvieu increased to 1.7 c/gal during July, compared to a 1.6 c/gal discount in June and a 0.1 c/gal discount in May. In July 2022, Conway was at an average discount of 3.7 c/gal while in 2018 it was at a discount of 21.7 c/gal. The 5-year average Conway discount for July is 7.3 c/gal. As of August 4, the Conway spot propane (OPIS) discount to Mont Belvieu had narrowed to 0.4 c/gal.

### CONWAY PROPANE SPREAD — FORWARD CURVE ANALYSIS

Figure 2.6 shows the propane forward price curves for Conway (blue line) and Mont Belvieu (red line) on the left-hand axis. The gray area is the differential on the right axis. The Mont Belvieu-Conway price spread is a good indicator whether the market is incenting barrels to flow from PADD 2 to PADD 3 or keep barrels in the Midwest. The current forward curves expect Belvieu to trade at a 1.2 c/gal premium to Conway in August, then gradually narrow during September before flipping to a small discount in October.

For 2023, the forward curves project that Gulf Coast propane prices will trade above Conway for most of the year, with Mont Belvieu averaging 1 c/gal over Conway compared to a 0.8 c/gal premium last year.

MB Non-TET vs. Conway Propane Spread

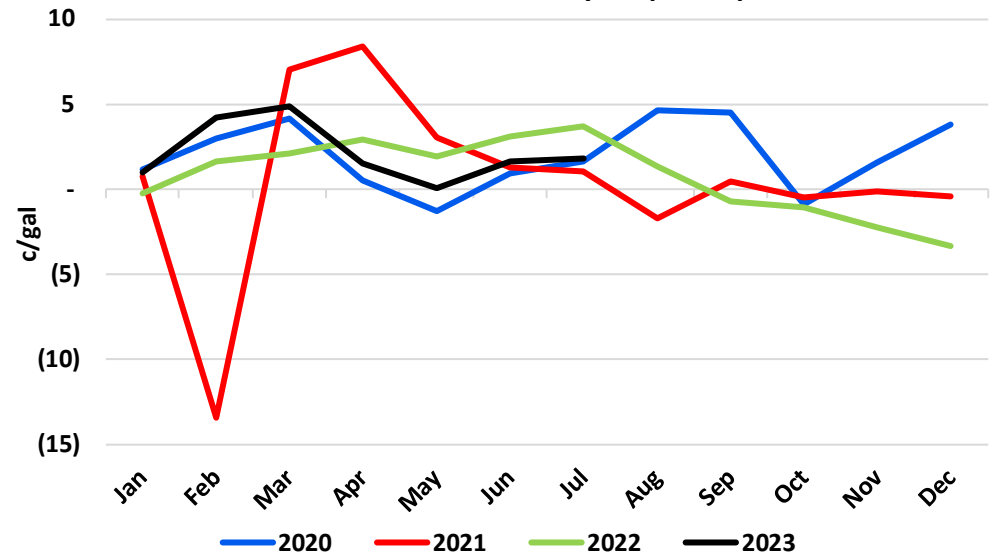
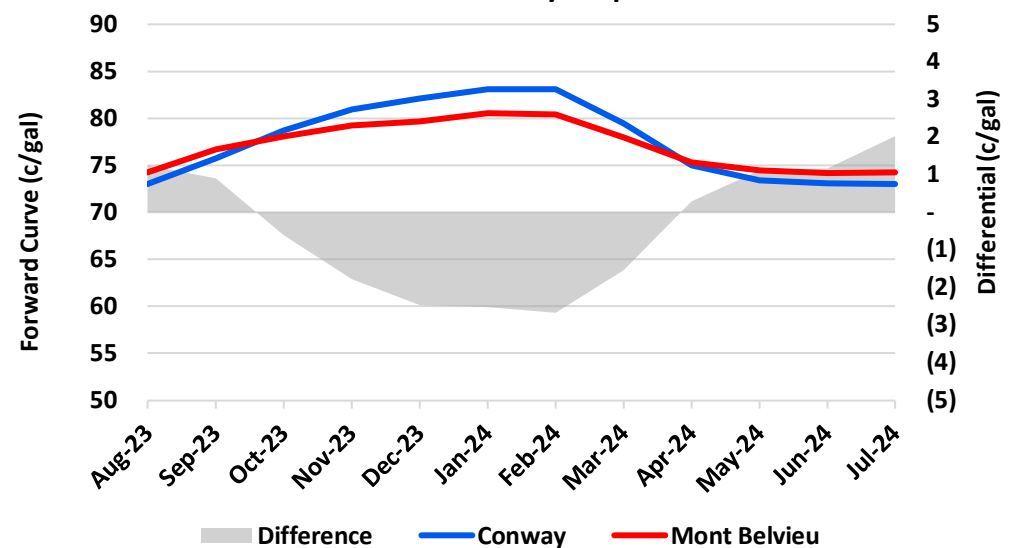


Figure 2.6

MB Non-TET vs. Conway Propane Forward Curve



## U.S. PROPANE DEMAND

| Table C:               | MM gal / month |              |              |              |              |            | M bbl / day |            |              |            |            |            |
|------------------------|----------------|--------------|--------------|--------------|--------------|------------|-------------|------------|--------------|------------|------------|------------|
|                        | MONTHLY        |              |              | ESTIMATED    |              | FORECAST   | MONTHLY     |            |              | ESTIMATED  |            | FORECAST   |
|                        | Apr-23         | May-23       | M/M          | Jun-23       | Jul-23       |            | Apr-23      | May-23     | M/M          | Jun-23     | Jul-23     |            |
| ResCom                 | 504            | 397          | (107)        | 384          | 385          | 326        | 400         | 305        | (95)         | 305        | 295        | 251        |
| Crop Drying            | 39             | 39           | 0            | 39           | 39           | 80         | 31          | 30         | (1)          | 31         | 30         | 62         |
| Industrial             | 82             | 84           | 2            | 90           | 94           | 91         | 65          | 64         | (1)          | 72         | 72         | 70         |
| Petrochemicals         | 226            | 228          | 1            | 201          | 208          | 224        | 180         | 175        | (5)          | 160        | 160        | 172        |
| PDH                    | 76             | 85           | 9            | 88           | 104          | 111        | 60          | 65         | 5            | 70         | 80         | 85         |
| Balancing              | (54)           | (152)        | (98)         | (101)        | (71)         | (245)      | (43)        | (117)      | (74)         | (80)       | (55)       | (188)      |
| <b>TOTAL PROPANE</b>   | <b>873</b>     | <b>680</b>   | <b>(194)</b> | <b>702</b>   | <b>758</b>   | <b>586</b> | <b>693</b>  | <b>522</b> | <b>(171)</b> | <b>557</b> | <b>582</b> | <b>450</b> |
| Propylene              | 340            | 361          | 20           | 325          | 336          | 332        | 270         | 277        | 7            | 258        | 258        | 255        |
| <b>TOTAL DEMAND **</b> | <b>1,213</b>   | <b>1,040</b> | <b>(173)</b> | <b>1,027</b> | <b>1,094</b> | <b>918</b> | <b>963</b>  | <b>799</b> | <b>(164)</b> | <b>815</b> | <b>840</b> | <b>705</b> |
| Weekly***              | 1,142          | 839          | (303)        | 1,011        | 1,061        |            | 906         | 644        | (262)        | 803        | 815        |            |
| Variance               | (72)           | (201)        | (130)        | (16)         | (32)         |            | (57)        | (155)      | (98)         | (13)       | (25)       |            |

\* EIA reports purity propane product supplied in monthly data, while weekly data includes propylene.

\*\* Total Demand" is the equivalent of product supplied as reported by the EIA.

\*\*\* Monthly product supplied from EIA through May 2023, weekly through the week of July 28, 2023.

## RESIDENTIAL &amp; COMMERCIAL

Figure 3.1 shows our forecast for Residential & Commercial ("ResCom") propane demand. ResCom demand was seasonally lower in July at 295 Mb/d, down 10 Mb/d from June. ResCom demand for August is expected to decline again to 251 Mb/d, a decrease of 44 Mb/d from July.

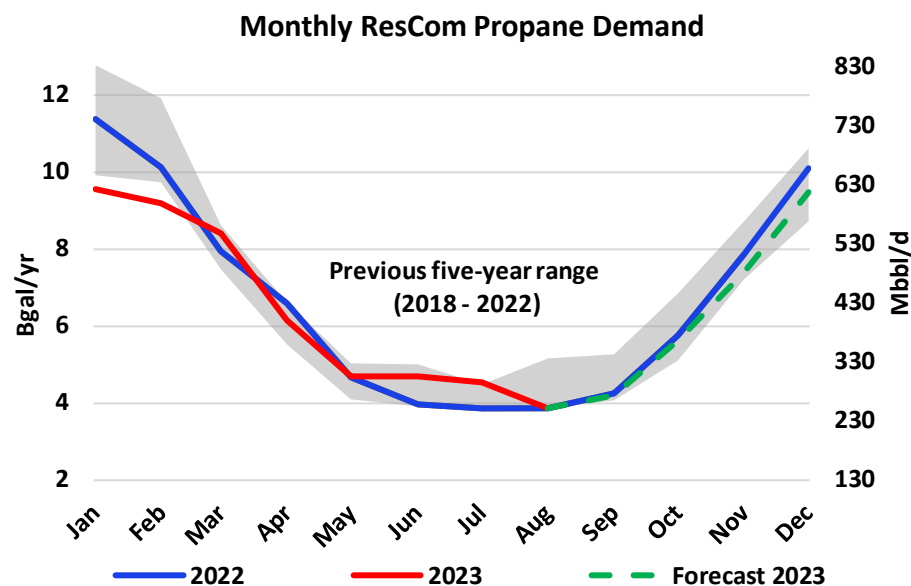
## AGRICULTURAL (CROP DRYING) DEMAND OUTLOOK

Crop drying is expected to pick up in August to 62 Mb/d (80 MMgal/m). We should see crop-drying demand continue to increase in September and peak in October-November, especially in the Midwest, where about 90% of the U.S. corn crop is grown.

## PETROCHEMICAL DEMAND REMAINS WEAK

Steam cracker demand for propane remained depressed during the month at 160 Mb/d, mainly due to maintenance outages and poor margins. We expect cracker demand for propane to stay near minimum as margins have deteriorated with the increase in propane prices. PDH demand was higher in July at 80 Mb/d with the startup of Enterprise's new PDH 2 unit (35 Mb/d propane).

Figure 3.1



## U.S. PROPANE EXPORTS

| Table D: U.S. Propane Exports Monthly and Weekly* |              |              |           |              |              |              |
|---|--------------|--------------|-----------|--------------|--------------|--------------|
| (Mbbbl/d)   | MONTHLY EIA  |              |           | ESTIMATED    |              | FORECAST     |
|   | Apr-23       | May-23       | M/M       | Jun-23       | Jul-23       | Aug-23       |
| Gulf Coast  | 1,284        | 1,263        | (21)      | 1,283        | 1,344        | 1,340        |
| East Coast  | 141          | 188          | 47        | 177          | 179          | 181          |
| West Coast  | 33           | 23           | (10)      | 35           | 30           | 28           |
| Other   | 7            | 6            | (1)       | 6            | 6            | 5            |
| <b>TOTAL EXPORTS</b>                              | <b>1,465</b> | <b>1,480</b> | <b>15</b> | <b>1,501</b> | <b>1,559</b> | <b>1,554</b> |
| Weekly  | 1,559        | 1,475        | (83)      | 1,539        | 1,523        |              |
| Variance  | 94           | (5)          | (98)      | 38           | (35)         |              |

\*Monthly data from EIA through May 2023, weekly through the week of July 28, 2023.  
See [RBN's NGL Voyager Report](#) for additional details on propane exports.

## EAST COAST EXPORTS

East Coast propane exports from Marcus Hook in Pennsylvania were strong at 179 Mb/d in July, up 2 Mb/d from June. PADD 1 exports are expected to remain robust in August at 181 Mb/d, which is 21 Mb/d higher than August 2022. East Coast exports (green bars in Figure 4.1) are forecast to grow at a good rate in

2023, averaging 150 Mb/d, up 16 Mb/d from 2022. No propane cargoes were imported into the Newington, NH, or Providence, RI, terminals in July.

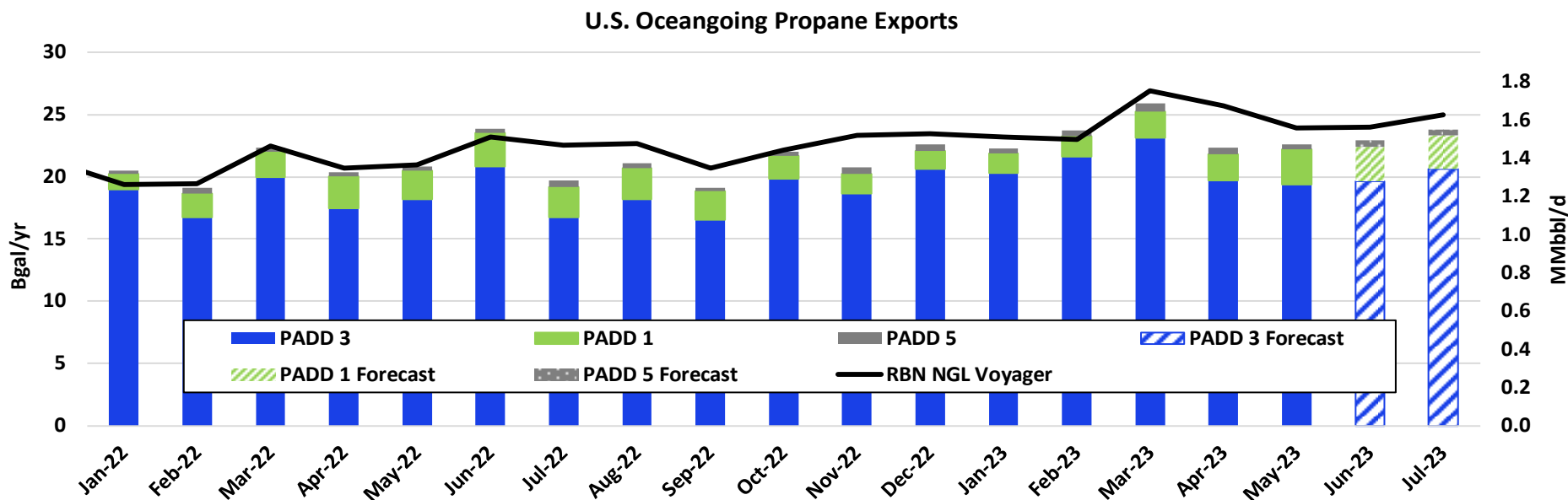
## GULF COAST EXPORTS

Gulf Coast propane exports were stronger in July at 1,344 Mb/d, up 61 Mb/d from June and 251 Mb/d higher than July 2022. For August, we expect PADD 3 exports to remain nearly flat at 1,340 Mb/d. Gulf Coast exports (blue bars in Figure 4.1) are forecast to grow at a healthy clip in 2023, averaging 1,354 Mb/d, up 143 Mb/d, or 12%, from 2022.

## WEST COAST EXPORTS

On the West Coast, propane exports were down 5 Mb/d from the prior month to 30 Mb/d. PADD 5 exports are projected at 28 Mb/d for August and average 30 Mb/d for 2023, up 3 Mb/d from last year. All West Coast exports are destined for Asia (via the Ferndale, WA, terminal) or Mexico (railcars/trucks).

Figure 4.1





## INTERNATIONAL PROPANE

Figure 4.2

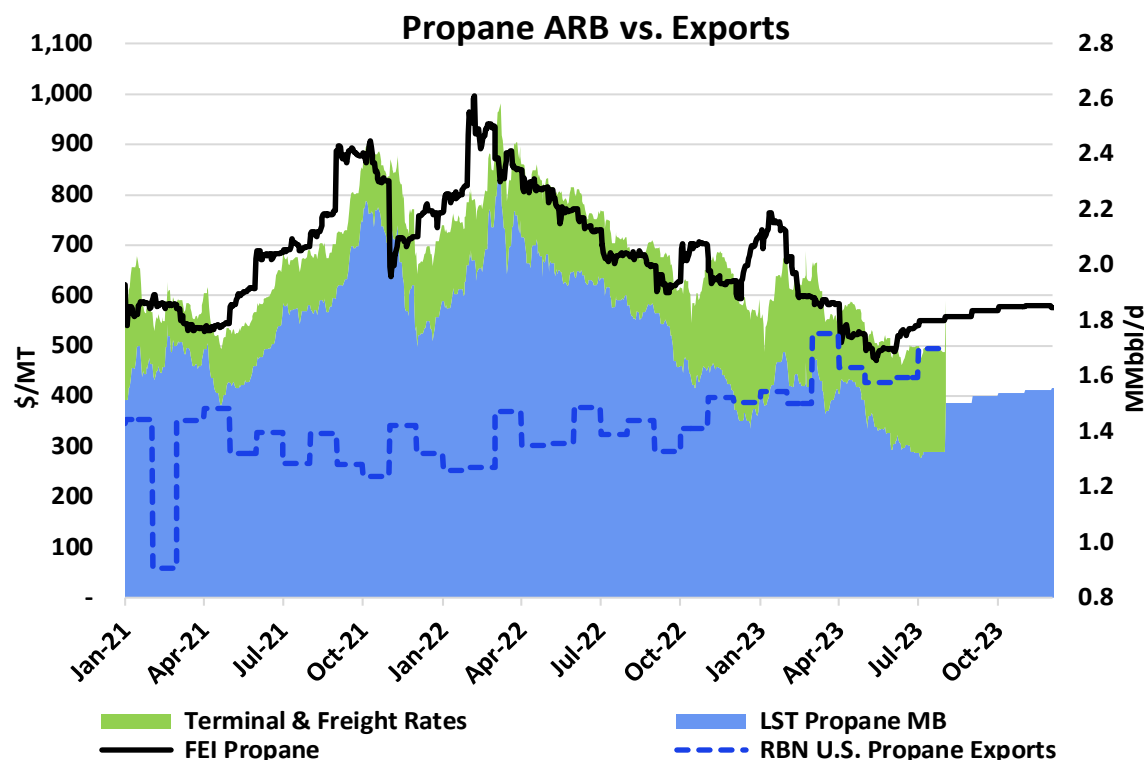
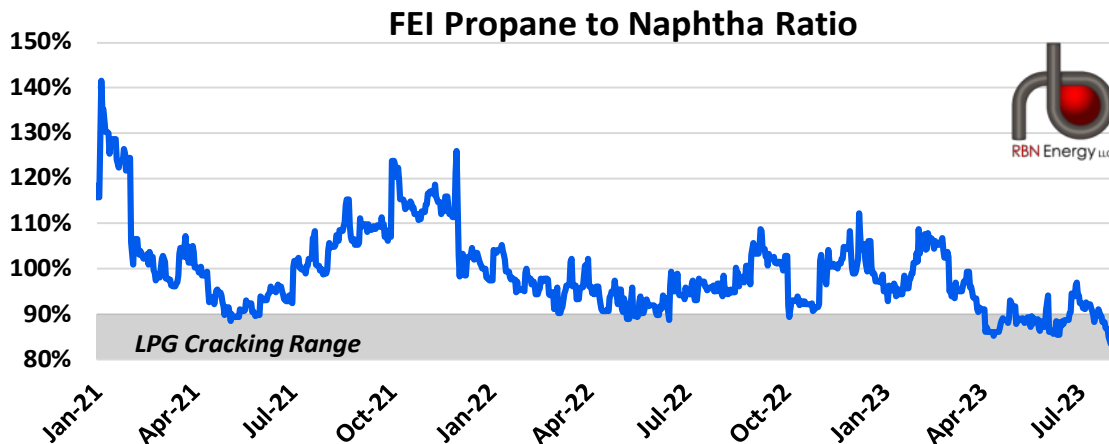


Figure 4.3



## U.S.-ASIA EXPORT ARB OPEN

Saudi Aramco increased its LPG contract prices (CP) for August for propane to \$470/MT (90.2 c/gal) and butane to \$460/MT (101.5 c/gal), up \$70/MT (13.4 c/gal) and \$85/MT (18.8 c/gal), respectively, from July.

VLGC freight rates were modestly lower in July. Spot VLGC freight rates from the U.S. Gulf Coast to Chiba, Japan, (via Panama Canal) declined by \$13/MT to \$168/MT as of July 31, which is 7.2% below the rate on July 3. Congestion at the Panama Canal was higher during the month, with wait times of 11 days northbound and nine days southbound as of July 31 (Figure 43). Spot terminal fees moved higher during the month, averaging 7 c/gal for September loadings on August 1.

Figure 4.2 compares the Asian arb to U.S. propane exports. The arb is open (economic) when the forward month of FEI propane (black line) is higher than the sum of the terminal and freight rates (green area) and the price of Lone Star (LST) propane at Mont Belvieu (blue area). Over the last month, the LST propane price at Mont Belvieu increased by \$99/MT (19 c/gal) to close at \$385/MT, or 74 c/gal, on July 31, while the FEI propane forward curve soared by \$114/MT, which resulted in a wider spread between U.S. and Asian prices. Thus, the arb for August-September increased to \$234/MT, or 45 c/gal, as of July 31. Taking into consideration terminal fees and freight costs, the arb for August-September was open (negative, thus economic) at minus \$29/MT, or minus 5.6 c/gal.

Figure 4.3 shows the ratio of the Asian FEI propane price to naphtha in the same region. On August 1, the ratio increased to 94%, which implies that Asian crackers will marginally favor naphtha feedstock over propane.

## U.S. PROPANE PRODUCTION

Figure 5.1

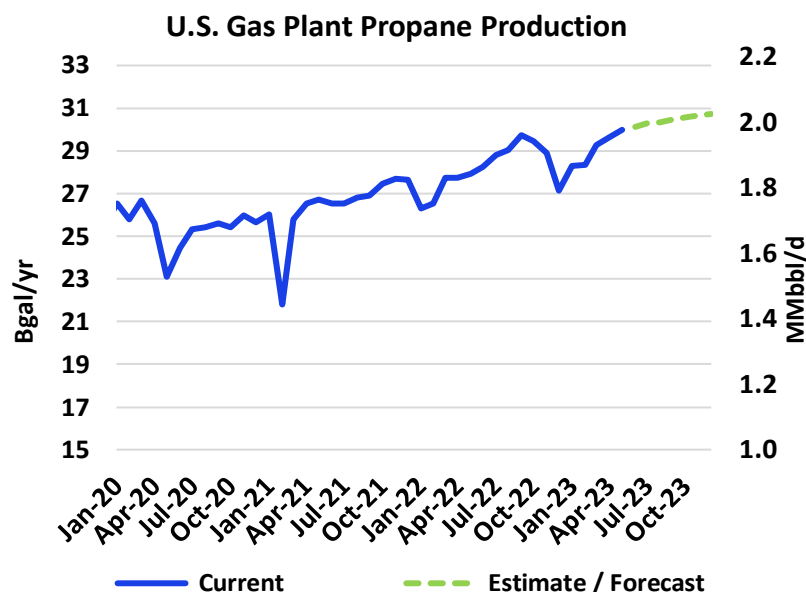
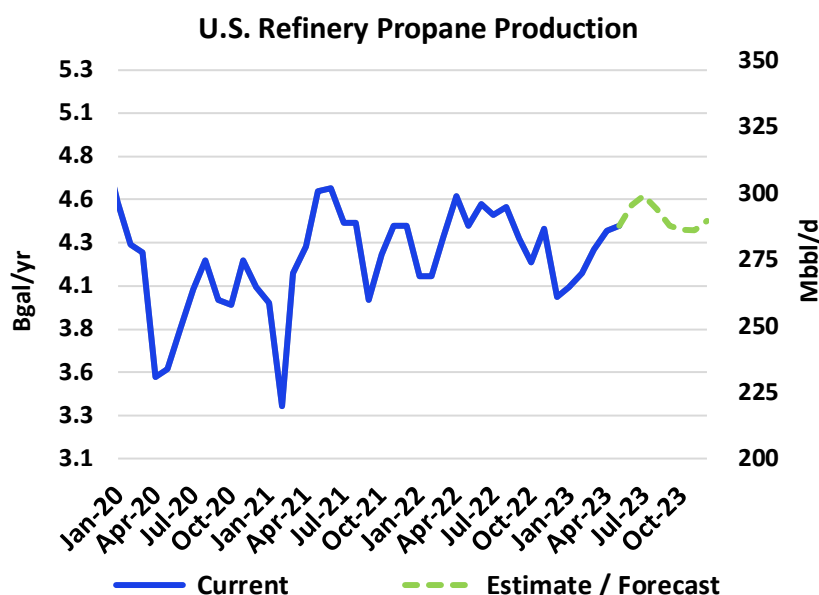


Figure 5.2



| Table E: U.S. Propane Production Monthly and Weekly* |              |              |           |              |              |              |
|--|--------------|--------------|-----------|--------------|--------------|--------------|
| (Mbbbl/d)  | MONTHLY EIA  |              |           | ESTIMATED    |              | FORECAST     |
|  | Apr-23       | May-23       | M/M       | Jun-23       | Jul-23       | Aug-23       |
| Gas Plant  | 1,956        | 1,979        | 23        | 1,988        | 1,996        | 2,001        |
| Refinery   | 286          | 288          | 2         | 296          | 299          | 294          |
| <b>TOTAL PROPANE</b>                                 | <b>2,242</b> | <b>2,267</b> | <b>25</b> | <b>2,284</b> | <b>2,296</b> | <b>2,295</b> |
| Propylene  | 261          | 256          | (5)       | 246          | 243          | 239          |
| <b>TOTAL PRODUCTION</b>                              | <b>2,503</b> | <b>2,523</b> | <b>20</b> | <b>2,529</b> | <b>2,539</b> | <b>2,534</b> |
| Weekly**   | 2,462        | 2,483        | 20        | 2,557        | 2,524        |              |
| Variance   | (41)         | (41)         | 0         | 28           | (14)         |              |

\* EIA reports purity propane production separately in monthly data, while weekly data includes propylene.

\*\* Monthly production from EIA through May 2023, weekly through the week of July 28, 2023.

## PROPANE GAS PLANT PRODUCTION HITS ALL-TIME HIGH

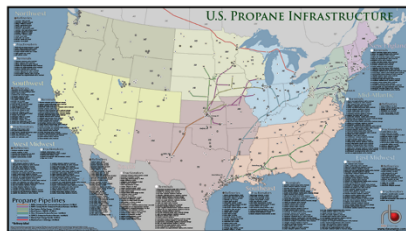
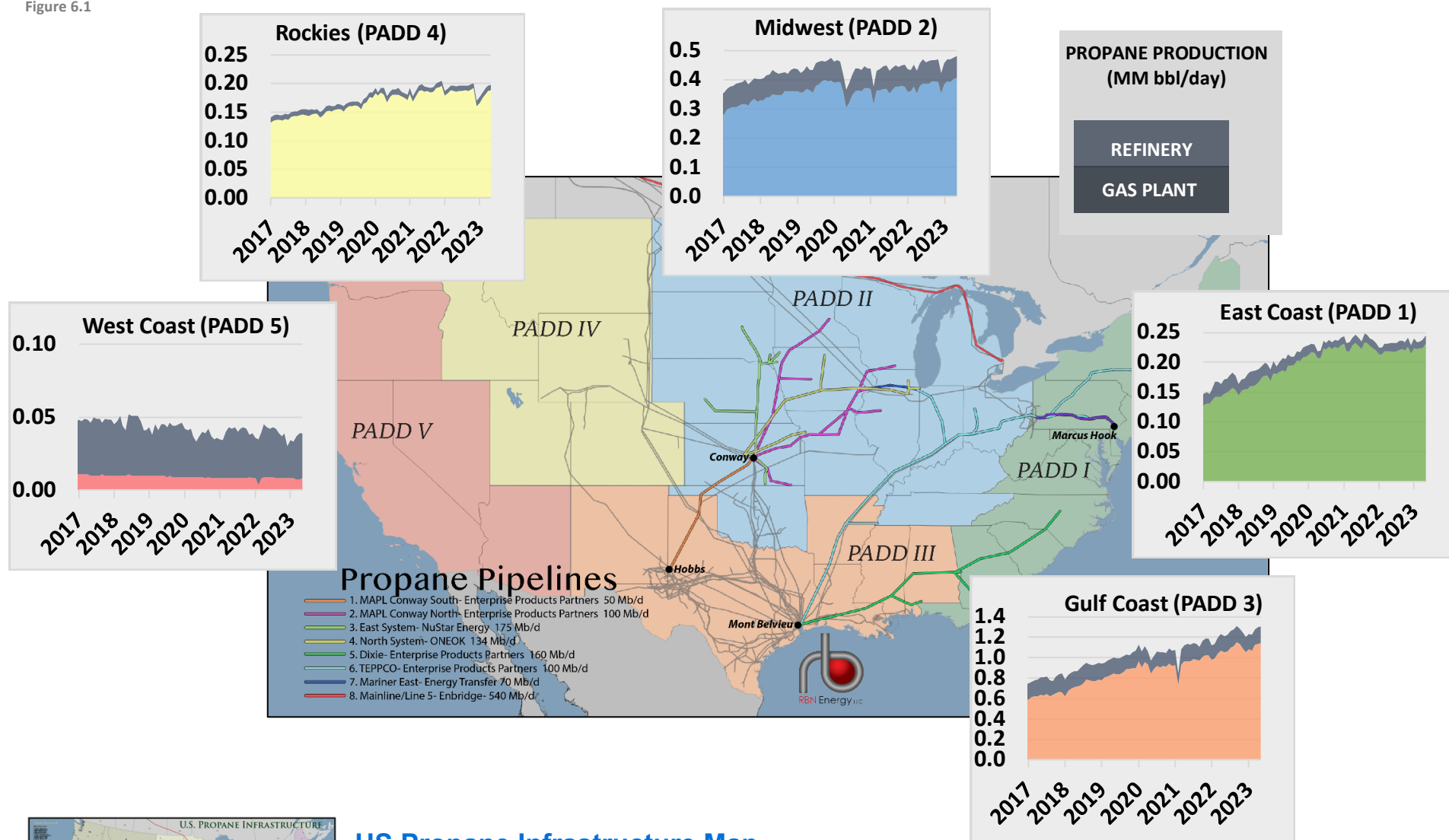
Propane gas plant production for May, as reported in the EIA Petroleum Supply Monthly issued July 31, came in strong, increasing 23 Mb/d from April. Total U.S. propane production for May 2023 was 1,979 Mb/d, up 125 Mb/d from May 2022 and 19 Mb/d above the September 2022 record rate. PADD 3 production for May 2023 was stronger at 1,143 Mb/d, up 6 Mb/d from April and only 6 Mb/d below all-time high. We estimate July gas plant production at 1,996 Mb/d, an increase of 8 Mb/d from June. Our forecast model projects gas plant production will grow in August to 2,001 Mb/d, which is 22 Mb/d above the May high. For 2023, we have trimmed our production outlook by 3 Mb/d to 1,972 Mb/d, up 116 Mb/d, or 6.3%, from 2022. Almost all production growth for the year is in PADD 3, primarily in the Permian Basin, with several new gas processing plants scheduled to come online during the second half of the year.

## REFINERY PRODUCTION SLIGHTLY STRONGER

July refinery propane production increased by 3 Mb/d to 299 Mb/d as capacity utilization increased by 1 percentage point to 93%. We forecast that production in August will decline to 294 Mb/d as refinery utilization falls back to about 92%. For 2023, we expect refinery propane production will be relatively flat and average 286 Mb/d for the year, up 3 Mb/d from 2022, due to slightly higher capacity utilization.

## U.S. PROPANE INFRASTRUCTURE MAP

Figure 6.1

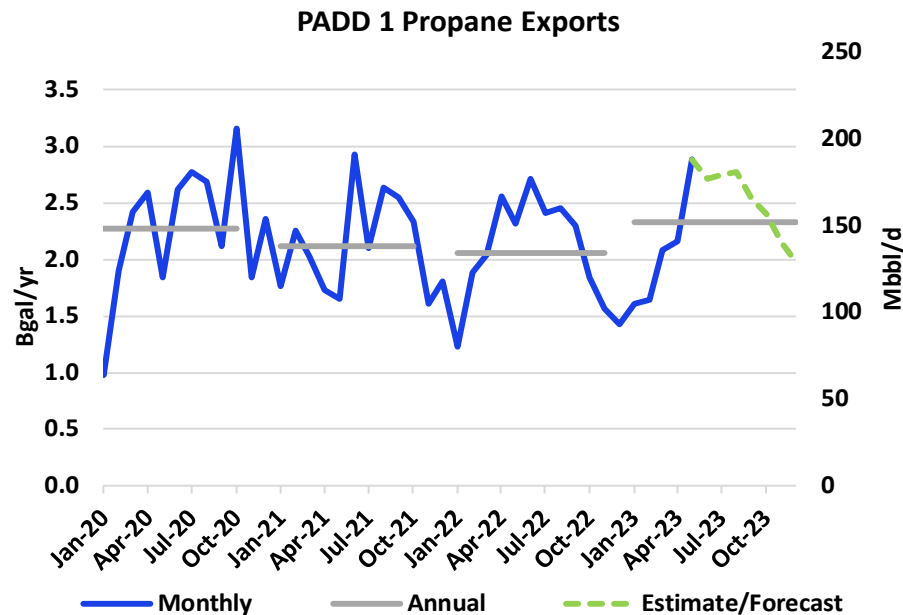
[US Propane Infrastructure Map](#)

Click on the link above for RBN's U.S. Propane Infrastructure Map, which fits together all the pieces of an opaque and regionally fragmented propane market to reveal the extensive domestic propane network in a clear, concise map.

## PADD 1: PROPANE SUPPLY &amp; DEMAND

| Table F:                 | MM gal / month |            |            |            |            |            |            | M bbl / day  |              |              |              |              |              |              |
|--------------------------|----------------|------------|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                          | EIA MONTHLY    |            | ESTIMATED  |            | FORECAST   |            |            | EIA MONTHLY  |              | ESTIMATED    |              | FORECAST     |              |              |
|                          | Apr-23         | May-23     | Jun-23     | Jul-23     | Aug-23     | Sep-23     | Oct-23     | Apr-23       | May-23       | Jun-23       | Jul-23       | Aug-23       | Sep-23       | Oct-23       |
| Production               | 300            | 319        | 310        | 323        | 322        | 313        | 325        | 238          | 245          | 246          | 248          | 248          | 248          | 249          |
| Gas Plants               | 282            | 301        | 293        | 306        | 303        | 294        | 305        | 224          | 231          | 233          | 235          | 233          | 234          | 235          |
| Refinery                 | 18             | 18         | 17         | 17         | 20         | 19         | 19         | 14           | 14           | 13           | 13           | 15           | 15           | 15           |
| Imports                  | 19             | 10         | 11         | 9          | 19         | 23         | 24         | 15           | 8            | 8            | 7            | 15           | 19           | 19           |
| Net Inter-PADD Transfers | 222            | 228        | 207        | 257        | 213        | 210        | 223        | 176          | 175          | 164          | 198          | 164          | 166          | 171          |
| <b>TOTAL SUPPLY</b>      | <b>541</b>     | <b>557</b> | <b>527</b> | <b>590</b> | <b>554</b> | <b>546</b> | <b>572</b> | <b>429</b>   | <b>428</b>   | <b>419</b>   | <b>453</b>   | <b>426</b>   | <b>433</b>   | <b>439</b>   |
| Demand (Prod. Supplied)  | 335            | 329        | 322        | 274        | 297        | 320        | 357        | 266          | 253          | 256          | 210          | 228          | 254          | 274          |
| Exports                  | 178            | 245        | 223        | 233        | 236        | 209        | 204        | 141          | 188          | 177          | 179          | 181          | 166          | 157          |
| Stock Change             | 28             | (16)       | (18)       | 83         | 22         | 18         | 11         | 22           | (12)         | (14)         | 64           | 17           | 14           | 9            |
| <b>TOTAL DISPOSITION</b> | <b>541</b>     | <b>559</b> | <b>527</b> | <b>590</b> | <b>554</b> | <b>546</b> | <b>572</b> | <b>429</b>   | <b>429</b>   | <b>419</b>   | <b>453</b>   | <b>426</b>   | <b>433</b>   | <b>439</b>   |
| <b>TOTAL INVENTORY</b>   | <b>236</b>     | <b>220</b> | <b>202</b> | <b>285</b> | <b>307</b> | <b>324</b> | <b>336</b> | <b>5,620</b> | <b>5,243</b> | <b>4,821</b> | <b>6,791</b> | <b>7,308</b> | <b>7,725</b> | <b>7,997</b> |

Figure 7.1



## INSIGHTS &amp; ANALYSIS

PADD 1 (East Coast) had a robust gain in stocks of 2 MMbbl for July, which was well above the 1.1-MMbbl increase last year and the 5-year average build of 0.9 MMbbl. Lower demand (product supplied) and higher inter-PADD receipts were the primary reason for the strong build, leaving stocks at 6.8 MMbbl (285 MMgal). This puts PADD 1 inventory 0.2 MMbbl above July 2022 and 0.3 MMbbl higher than the 5-year average. Exports were robust at 179 Mb/d, up 37 Mb/d from the 2023 year-to-date average. Gas plant production in the Northeast was slightly higher, increasing by 2 Mb/d to 235 Mb/d.

## PADD 1 OUTLOOK

Our propane model estimates East Coast inventories will increase by 517 Mbbl in August to 7.3 MMbbl (307 MMgal), leaving stocks 252 Mbbl, or 3%, below the 5-year average. As shown in Figure 7.1, East Coast exports are expected to remain strong in August at 181 Mb/d, which is 33 Mb/d above the 2022 average rate and 21 Mb/d higher than August 2022. Exports are projected to average 150 Mb/d in 2023, an increase of 16 Mb/d from last year.



## PADD 2: PROPANE SUPPLY &amp; DEMAND

| Table G:                 | MM gal / month |            |            |            |              |              |              | M bbl / day   |               |               |               |               |               |               |
|--------------------------|----------------|------------|------------|------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                          | EIA MONTHLY    |            | ESTIMATED  |            | FORECAST     |              |              | EIA MONTHLY   |               | ESTIMATED     |               | FORECAST      |               |               |
|                          | Apr-23         | May-23     | Jun-23     | Jul-23     | Aug-23       | Sep-23       | Oct-23       | Apr-23        | May-23        | Jun-23        | Jul-23        | Aug-23        | Sep-23        | Oct-23        |
| Production               | 599            | 628        | 616        | 636        | 632          | 613          | 634          | 475           | 482           | 489           | 488           | 485           | 487           | 487           |
| Gas Plants               | 505            | 531        | 517        | 532        | 533          | 517          | 536          | 401           | 408           | 410           | 409           | 410           | 411           | 411           |
| Refinery                 | 93             | 96         | 99         | 103        | 98           | 96           | 98           | 74            | 74            | 79            | 79            | 76            | 76            | 75            |
| Imports                  | 26             | 26         | 33         | 36         | 22           | 23           | 37           | 21            | 20            | 27            | 28            | 17            | 19            | 29            |
| Net Inter-PADD Transfers | (469)          | (464)      | (454)      | (491)      | (414)        | (394)        | (352)        | (372)         | (356)         | (360)         | (377)         | (318)         | (313)         | (270)         |
| <b>TOTAL SUPPLY</b>      | <b>156</b>     | <b>190</b> | <b>195</b> | <b>181</b> | <b>240</b>   | <b>243</b>   | <b>319</b>   | <b>124</b>    | <b>146</b>    | <b>155</b>    | <b>139</b>    | <b>185</b>    | <b>193</b>    | <b>245</b>    |
| Demand (Prod. Supplied)  | 95             | 12         | 54         | 86         | 146          | 198          | 305          | 75            | 9             | 43            | 66            | 113           | 157           | 235           |
| Exports                  | 9              | 8          | 7          | 7          | 7            | 6            | 5            | 7             | 6             | 6             | 6             | 5             | 5             | 4             |
| Stock Change             | 54             | 171        | 135        | 87         | 87           | 39           | 8            | 43            | 131           | 107           | 67            | 67            | 31            | 6             |
| <b>TOTAL DISPOSITION</b> | <b>158</b>     | <b>190</b> | <b>195</b> | <b>181</b> | <b>240</b>   | <b>243</b>   | <b>319</b>   | <b>125</b>    | <b>146</b>    | <b>155</b>    | <b>139</b>    | <b>185</b>    | <b>193</b>    | <b>245</b>    |
| <b>TOTAL INVENTORY</b>   | <b>557</b>     | <b>727</b> | <b>862</b> | <b>949</b> | <b>1,037</b> | <b>1,076</b> | <b>1,084</b> | <b>13,252</b> | <b>17,317</b> | <b>20,522</b> | <b>22,600</b> | <b>24,680</b> | <b>25,616</b> | <b>25,812</b> |

## INSIGHTS &amp; ANALYSIS

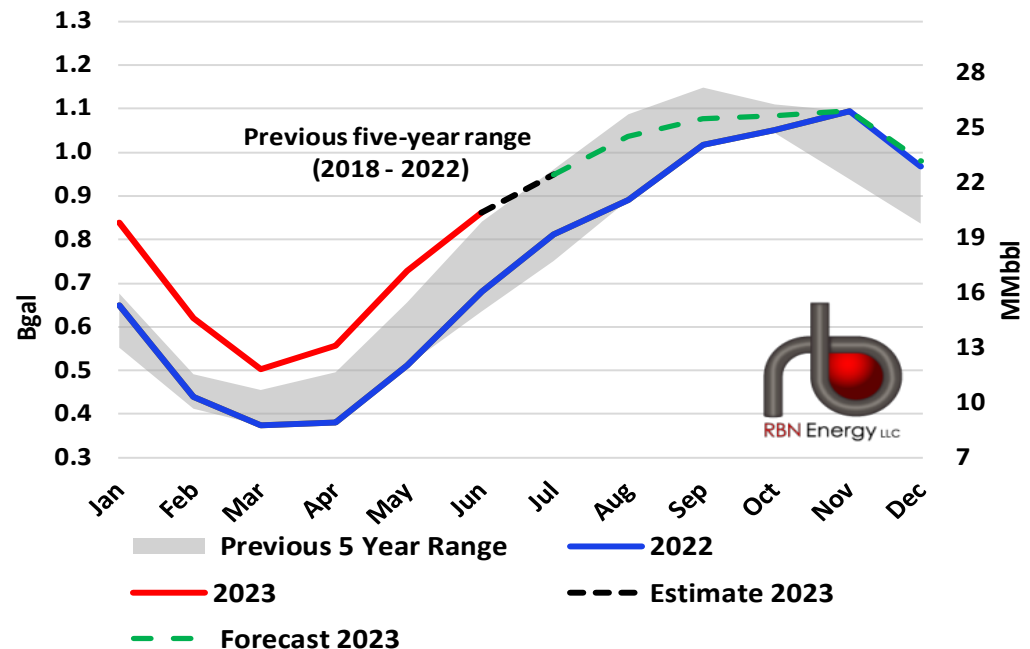
PADD 2 (Midwest) inventories built by 2.1 MMbbl during July, which was below the 3.1-MMbbl increase last year and the 5-year average build of 3.2 MMbbl, with stocks ending at 22.6 MMbbl (949 MMgal). The Midwest market is in a more comfortable supply position compared to last year with 3.2 MMbbl more in storage. Production was relatively flat in July at 488 Mb/d. Imports increased by 1 Mb/d to 28 Mb/d, which is 10 Mb/d less than last year and 5 Mb/d below the 2022 average rate.

## PADD 2 OUTLOOK

Midwest inventories are forecast to build by 2.1 Mbbbl in August compared to a 5-year average increase of 2.9 MMbbl, bringing ending inventories to 24.7 MMbbl (1,037 MMgal), 3.4 MMbbl higher than last year and 1 MMbbl above the 5-year average. Canadian imports into the Midwest are projected to average 28 Mb/d in 2023, down 17 Mb/d from last year, primarily due to the ramp-up of Inter Pipeline's propane dehydrogenation (PDH) plant in Western Canada (22 Mb/d propane demand).

Figure 7.2

## PADD 2 Monthly EIA Propane Inventories

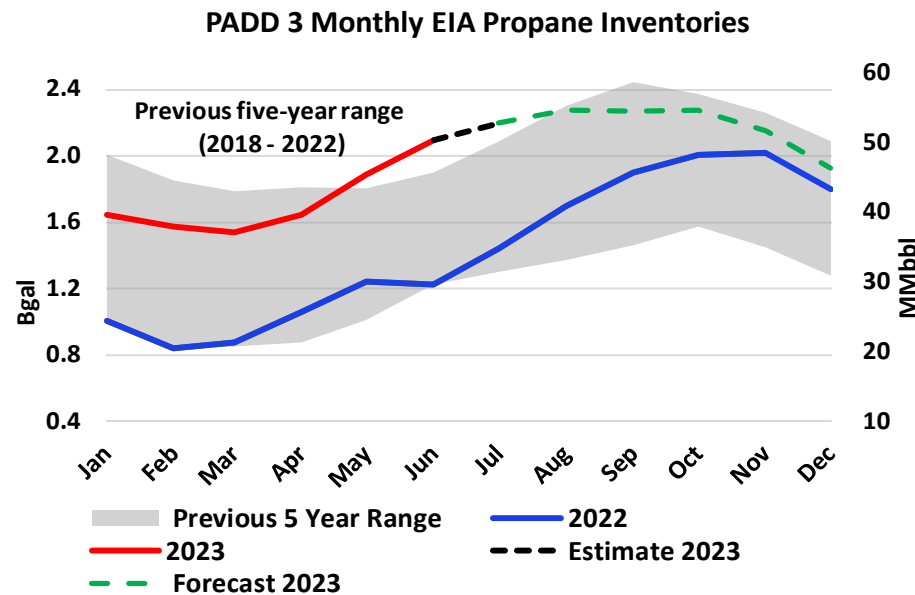


Source: EIA

## PADD 3: PROPANE SUPPLY &amp; DEMAND

| Table H:                 | MM gal / month |              |              |              |              |              |              | M bbl / day   |               |               |               |               |               |               |
|--------------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                          | EIA MONTHLY    |              | ESTIMATED    |              | FORECAST     |              |              | EIA MONTHLY   |               | ESTIMATED     |               | FORECAST      |               |               |
|                          | Apr-23         | May-23       | Jun-23       | Jul-23       | Aug-23       | Sep-23       | Oct-23       | Apr-23        | May-23        | Jun-23        | Jul-23        | Aug-23        | Sep-23        | Oct-23        |
| Production               | 1,633          | 1,700        | 1,651        | 1,718        | 1,727        | 1,670        | 1,730        | 1,296         | 1,306         | 1,311         | 1,320         | 1,326         | 1,325         | 1,328         |
| Gas Plants               | 1,433          | 1,488        | 1,444        | 1,500        | 1,511        | 1,469        | 1,524        | 1,137         | 1,143         | 1,146         | 1,152         | 1,160         | 1,166         | 1,170         |
| Refinery                 | 200            | 212          | 207          | 218          | 216          | 200          | 206          | 159           | 163           | 164           | 168           | 166           | 159           | 158           |
| Imports                  | -              | -            | -            | -            | -            | -            | -            | -             | -             | -             | -             | -             | -             | -             |
| Net Inter-PADD Transfers | 433            | 422          | 410          | 426          | 394          | 370          | 325          | 344           | 324           | 325           | 327           | 303           | 293           | 250           |
| <b>TOTAL SUPPLY</b>      | <b>2,066</b>   | <b>2,122</b> | <b>2,061</b> | <b>2,144</b> | <b>2,121</b> | <b>2,039</b> | <b>2,055</b> | <b>1,640</b>  | <b>1,630</b>  | <b>1,636</b>  | <b>1,647</b>  | <b>1,629</b>  | <b>1,619</b>  | <b>1,578</b>  |
| Demand (Prod. Supplied)  | 340            | 238          | 235          | 295          | 293          | 345          | 279          | 270           | 183           | 186           | 227           | 225           | 274           | 215           |
| Exports                  | 1,618          | 1,644        | 1,617        | 1,750        | 1,745        | 1,701        | 1,771        | 1,284         | 1,263         | 1,283         | 1,344         | 1,340         | 1,350         | 1,360         |
| Stock Change             | 108            | 240          | 210          | 99           | 83           | (6)          | 5            | 86            | 184           | 166           | 76            | 64            | (5)           | 4             |
| <b>TOTAL DISPOSITION</b> | <b>2,066</b>   | <b>2,122</b> | <b>2,061</b> | <b>2,144</b> | <b>2,121</b> | <b>2,039</b> | <b>2,055</b> | <b>1,640</b>  | <b>1,630</b>  | <b>1,636</b>  | <b>1,647</b>  | <b>1,629</b>  | <b>1,619</b>  | <b>1,578</b>  |
| <b>TOTAL INVENTORY</b>   | <b>1,647</b>   | <b>1,887</b> | <b>2,097</b> | <b>2,196</b> | <b>2,279</b> | <b>2,272</b> | <b>2,277</b> | <b>39,219</b> | <b>44,938</b> | <b>49,929</b> | <b>52,285</b> | <b>54,255</b> | <b>54,102</b> | <b>54,213</b> |

Figure 7.3



Source: EIA

## INSIGHTS &amp; ANALYSIS

PADD 3 had a modest stock increase of 2.4 MMbbl for the month, which was below the 5.1-MMbbl build in July 2022 and the 5-year average gain for the month of 2.6 MMbbl. The build brought Gulf Coast inventories to 52.3 MMbbl (2.2 Bgal) at month's end, 17.9 MMbbl higher than last year and 13.1 MMbbl, or 33%, above the 5-year average. Propane exports from the Gulf Coast were stronger at 1,344 Mb/d, up 61 Mb/d from June and 251 Mb/d higher than in July 2022. PADD 3 gas plant production increased to 1,152 Mb/d in July, up 6 Mb/d from June and 3 Mb/d above the record high in September 2022.

## PADD 3 OUTLOOK

August inventories are forecast to build at a modest rate as exports remain strong, rising by 2 MMbbl, which is below the 5-year average build of 4.1 Mbbl. That would leave August ending stocks at 54.3 MMbbl (2.3 Bgal), which is 13.9 MMbbl more than last year and 10.9 MMbbl above the 5-year average. Gulf Coast propane production is expected to grow by 8 Mb/d in August to 1,160 Mb/d, which is 11 Mb/d above September 2022's all-time high.

## PADD 4: PROPANE SUPPLY &amp; DEMAND

| Table I:                 | MM gal / month |           |            |            |            |            |            | M bbl / day  |              |              |              |              |              |              |
|--------------------------|----------------|-----------|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                          | EIA MONTHLY    |           | ESTIMATED  |            | FORECAST   |            |            | EIA MONTHLY  |              | ESTIMATED    |              | FORECAST     |              |              |
|                          | Apr-23         | May-23    | Jun-23     | Jul-23     | Aug-23     | Sep-23     | Oct-23     | Apr-23       | May-23       | Jun-23       | Jul-23       | Aug-23       | Sep-23       | Oct-23       |
| Production               | 244            | 254       | 248        | 258        | 257        | 249        | 257        | 194          | 195          | 197          | 198          | 198          | 198          | 198          |
| Gas Plants               | 236            | 246       | 240        | 249        | 248        | 240        | 248        | 187          | 189          | 191          | 191          | 191          | 191          | 191          |
| Refinery                 | 9              | 8         | 8          | 9          | 9          | 9          | 9          | 7            | 6            | 7            | 7            | 7            | 7            | 7            |
| Imports                  | 20             | 14        | 13         | 12         | 13         | 10         | 13         | 16           | 11           | 10           | 9            | 10           | 8            | 10           |
| Net Inter-PADD Transfers | (204)          | (211)     | (181)      | (207)      | (210)      | (203)      | (215)      | (162)        | (162)        | (144)        | (159)        | (161)        | (161)        | (165)        |
| <b>TOTAL SUPPLY</b>      | <b>60</b>      | <b>57</b> | <b>80</b>  | <b>63</b>  | <b>61</b>  | <b>56</b>  | <b>56</b>  | <b>48</b>    | <b>44</b>    | <b>63</b>    | <b>48</b>    | <b>47</b>    | <b>45</b>    | <b>43</b>    |
| Demand (Prod. Supplied)  | 53             | 44        | 48         | 50         | 59         | 54         | 61         | 42           | 34           | 38           | 38           | 45           | 43           | 47           |
| Exports                  | -              | -         | -          | -          | -          | -          | -          | -            | -            | -            | -            | -            | -            | -            |
| Stock Change             | 6              | 13        | 32         | 13         | 2          | 2          | (5)        | 5            | 10           | 25           | 10           | 2            | 2            | (4)          |
| <b>TOTAL DISPOSITION</b> | <b>59</b>      | <b>57</b> | <b>80</b>  | <b>63</b>  | <b>61</b>  | <b>56</b>  | <b>56</b>  | <b>47</b>    | <b>44</b>    | <b>63</b>    | <b>48</b>    | <b>47</b>    | <b>45</b>    | <b>43</b>    |
| <b>TOTAL INVENTORY</b>   | <b>82</b>      | <b>96</b> | <b>127</b> | <b>140</b> | <b>142</b> | <b>144</b> | <b>139</b> | <b>1,963</b> | <b>2,279</b> | <b>3,032</b> | <b>3,342</b> | <b>3,392</b> | <b>3,440</b> | <b>3,311</b> |

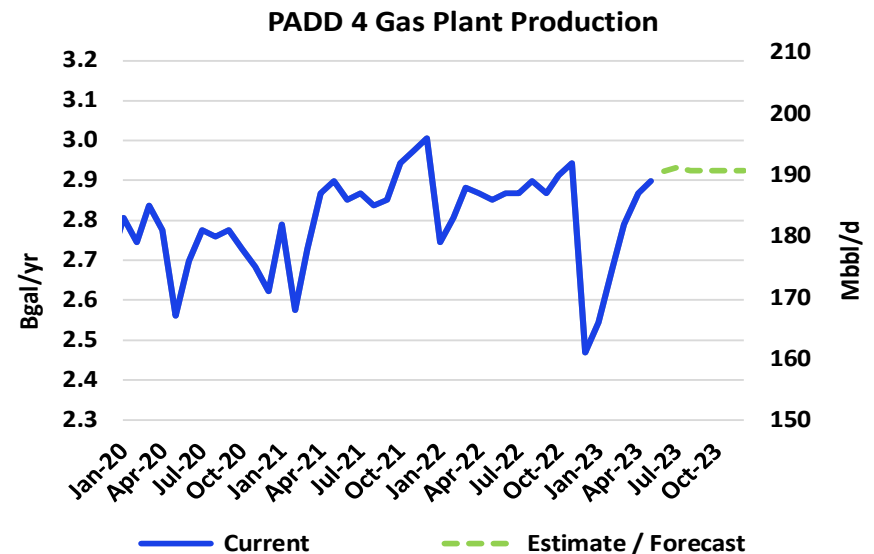
## INSIGHTS &amp; ANALYSIS

PADD 4 (Rocky Mountain) inventories built by 0.3 MMbbl in July to 3.3 MMbbl (140 MMgal), which is 894 Mbbl higher than last year and 1.2 MMbbl above the 5-year average. Gas plant production was relatively unchanged in July, increasing to 198 Mb/d, up 1 Mb/d from June (see Figure 7.4). Imports were slightly weaker at 9 Mb/d, down 1 Mb/d from the prior month.

## PADD 4 OUTLOOK

PADD 4 inventories are projected to build by just 50 Mbbl during the fifth month of the storage injection season (April-September), bringing August stocks to 3.4 MMbbl (142 MMgal), which is 665 Mbbl higher than last year and 1.1 MMbbl above the 5-year average. PADD 4 gas plant production is expected to remain flat in August at 191 Mb/d and average 186 Mb/d for the year, up 1 Mb/d from 2022.

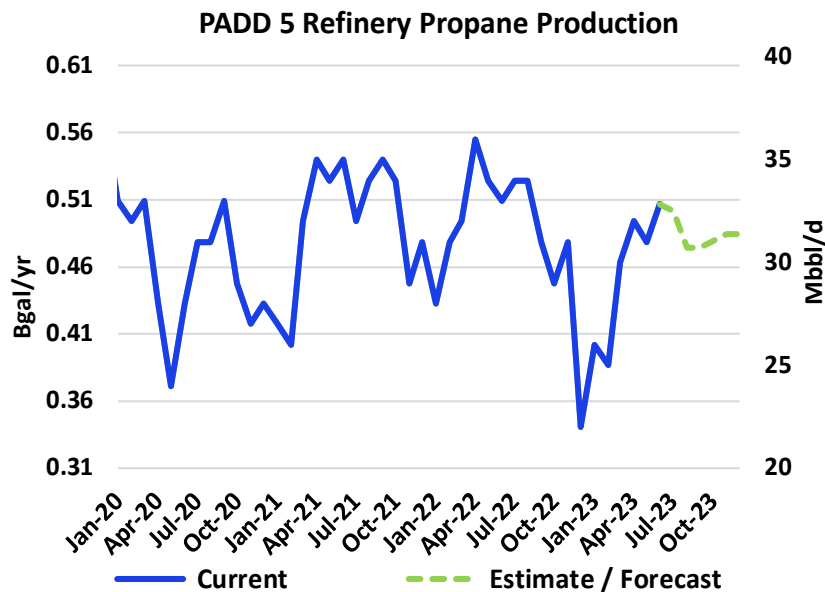
Figure 7.4



## PADD 5: PROPANE SUPPLY &amp; DEMAND

| Table J:                 | MM gal / month |            |            |            |           |           |            | M bbl / day |              |              |              |              |              |              |
|--------------------------|----------------|------------|------------|------------|-----------|-----------|------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                          | EIA MONTHLY    |            | ESTIMATED  |            | FORECAST  |           |            | EIA MONTHLY |              | ESTIMATED    |              | FORECAST     |              |              |
|                          | Apr-23         | May-23     | Jun-23     | Jul-23     | Aug-23    | Sep-23    | Oct-23     | Apr-23      | May-23       | Jun-23       | Jul-23       | Aug-23       | Sep-23       | Oct-23       |
| Production               | 49             | 51         | 52         | 55         | 50        | 49        | 51         | 39          | 39           | 41           | 42           | 38           | 39           | 39           |
| Gas Plants               | 9              | 10         | 11         | 12         | 10        | 10        | 10         | 7           | 8            | 8            | 9            | 8            | 8            | 8            |
| Refinery                 | 40             | 40         | 41         | 42         | 40        | 39        | 40         | 32          | 31           | 33           | 32           | 31           | 31           | 31           |
| Imports                  | 35             | 35         | 32         | 31         | 32        | 29        | 35         | 28          | 27           | 25           | 24           | 25           | 23           | 27           |
| Net Inter-PADD Transfers | 19             | 26         | 18         | 15         | 16        | 17        | 18         | 15          | 20           | 14           | 12           | 12           | 14           | 14           |
| <b>TOTAL SUPPLY</b>      | <b>103</b>     | <b>112</b> | <b>101</b> | <b>100</b> | <b>98</b> | <b>95</b> | <b>103</b> | <b>82</b>   | <b>86</b>    | <b>80</b>    | <b>77</b>    | <b>75</b>    | <b>75</b>    | <b>79</b>    |
| Demand (Prod. Supplied)  | 50             | 56         | 43         | 53         | 51        | 64        | 57         | 40          | 43           | 34           | 41           | 40           | 51           | 44           |
| Exports                  | 42             | 30         | 44         | 39         | 36        | 26        | 31         | 33          | 23           | 35           | 30           | 28           | 21           | 24           |
| Stock Change             | 11             | 25         | 14         | 8          | 10        | 4         | 15         | 9           | 19           | 11           | 6            | 8            | 3            | 12           |
| <b>TOTAL DISPOSITION</b> | <b>103</b>     | <b>111</b> | <b>101</b> | <b>100</b> | <b>98</b> | <b>95</b> | <b>103</b> | <b>82</b>   | <b>85</b>    | <b>80</b>    | <b>77</b>    | <b>75</b>    | <b>75</b>    | <b>79</b>    |
| <b>TOTAL INVENTORY</b>   | <b>29</b>      | <b>53</b>  | <b>67</b>  | <b>75</b>  | <b>86</b> | <b>90</b> | <b>106</b> | <b>680</b>  | <b>1,270</b> | <b>1,601</b> | <b>1,798</b> | <b>2,045</b> | <b>2,148</b> | <b>2,512</b> |

Figure 7.5



## INSIGHTS &amp; ANALYSIS

PADD 5 (West Coast) inventories grew by 0.2 MMbbl in July to 1.8 MMbbl (75 MMgal), leaving stocks 520 Mbbl higher than last year (5-year minimum) and only 37 Mbbl above the 5-year average. Refinery production was down 1 Mb/d to 32 Mb/d as capacity utilization fell by 3 percentage points to 89%. West Coast exports were weaker than the prior month at 30 Mb/d and above imports, which fell to 24 Mb/d.

## PADD 5 OUTLOOK

Our propane model projects West Coast inventories to increase by 247 Mbbl in August to 2 MMbbl (86 MMgal), leaving stocks 103 Mbbl below the 5-year average. As shown in Figure 7.5, refinery production in PADD 5 is expected to be slightly lower at 31 Mb/d in August as capacity utilization falls to ~85%. Imports are projected to stay around 25 Mb/d and average 30 Mb/d for the year, up 3 Mb/d from 2022. West Coast exports for August are estimated at 28 Mb/d, down 2 Mb/d from the prior month. PADD 5 exports are forecast to average 30 Mb/d for the year, up 3 Mb/d from 2022.



## KEY ENERGY PRICES

| Table K:              |          | Prices              |           |                   |       |          |                    |       |          |                   |        |
|-----------------------|----------|---------------------|-----------|-------------------|-------|----------|--------------------|-------|----------|-------------------|--------|
| Product               | Units    | Current<br>1-Aug-23 | 25-Jul-23 | Prior Week<br>W/W | W/W % | 1-Jul-23 | Prior Month<br>M/M | M/M % | 1-Aug-22 | Prior Year<br>Y/Y | Y/Y %  |
| Brent Crude           | \$/bbl   | 84.9                | 83.6      | 1.3               | 1.5%  | 74.9     | 10.0               | 13.4% | 100.0    | (15.1)            | -15.1% |
| WTI Cushing Crude     | \$/bbl   | 81.4                | 79.6      | 1.7               | 2.2%  | 70.6     | 10.7               | 15.2% | 93.9     | (12.5)            | -13.3% |
| Henry Hub Natural Gas | \$/MMbtu | 2.56                | 2.73      | (0.17)            | -6.2% | 2.80     | (0.24)             | -8.5% | 8.28     | (5.72)            | -69.1% |
| Propane               |          |                     |           |                   |       |          |                    |       |          |                   |        |
| Mont Belvieu Non-TET  | c/gal    | 68.3                | 62.7      | 5.5               | 8.8%  | 53.8     | 14.5               | 26.9% | 111.3    | (43.1)            | -38.7% |
| Mont Belvieu TET      | c/gal    | 71.7                | 65.2      | 6.5               | 10.0% | 55.3     | 16.4               | 29.6% | 111.0    | (39.3)            | -35.4% |
| Conway                | c/gal    | 69.2                | 61.2      | 8.1               | 13.2% | 51.7     | 17.5               | 33.9% | 108.5    | (39.2)            | -36.2% |
| Edmonton*             | c/gal    | 56.5                | 48.4      | 8.1               | 16.7% | 35.2     | 21.3               | 60.6% | 92.9     | (36.5)            | -39.2% |
| European (ARA)        | \$/MT    | 513.7               | 461.6     | 52.1              | 11.3% | 416.1    | 97.6               | 23.5% | 645.4    | (131.8)           | -20.4% |
| Asian (FEI)           | \$/MT    | 613.3               | 534.7     | 78.7              | 14.7% | 494.1    | 119.2              | 24.1% | 698.0    | (84.6)            | -12.1% |

Figure 8.1

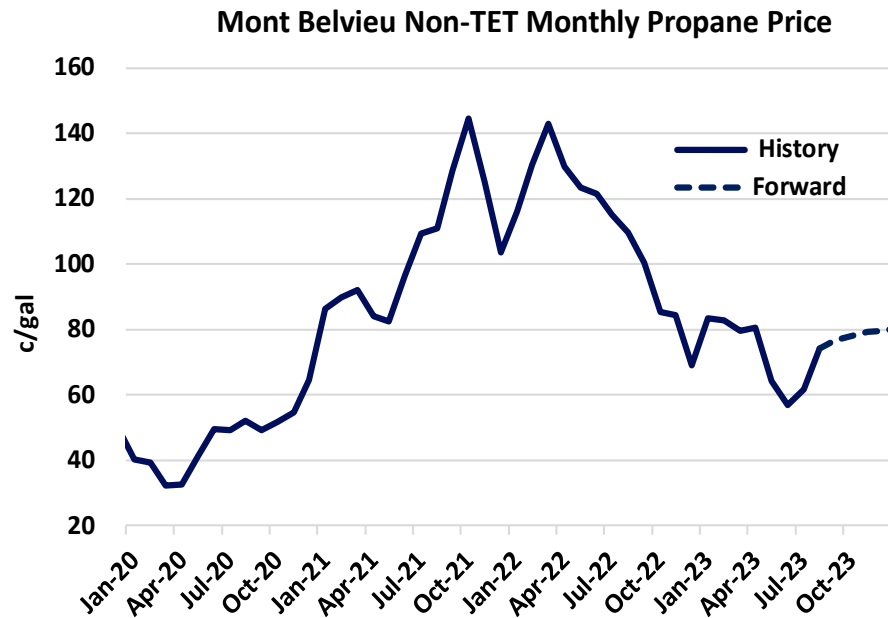
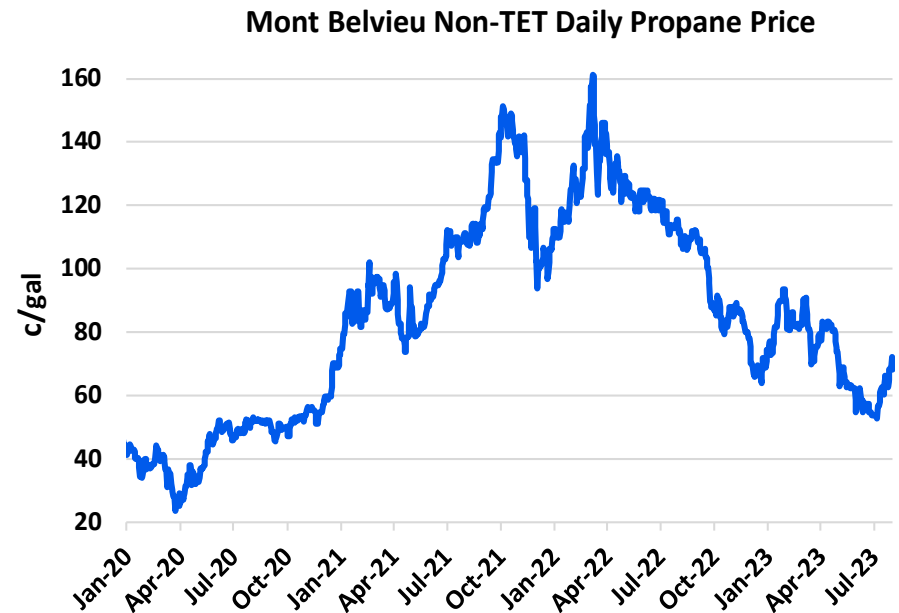


Figure 8.2



## MONTHLY PROPANE PRICE TRENDS

Figure 8.3

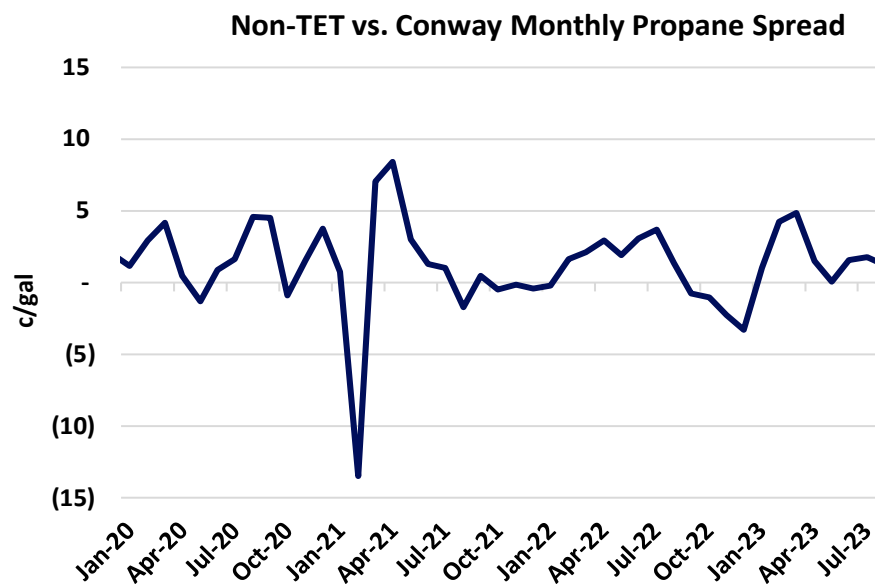


Figure 8.4

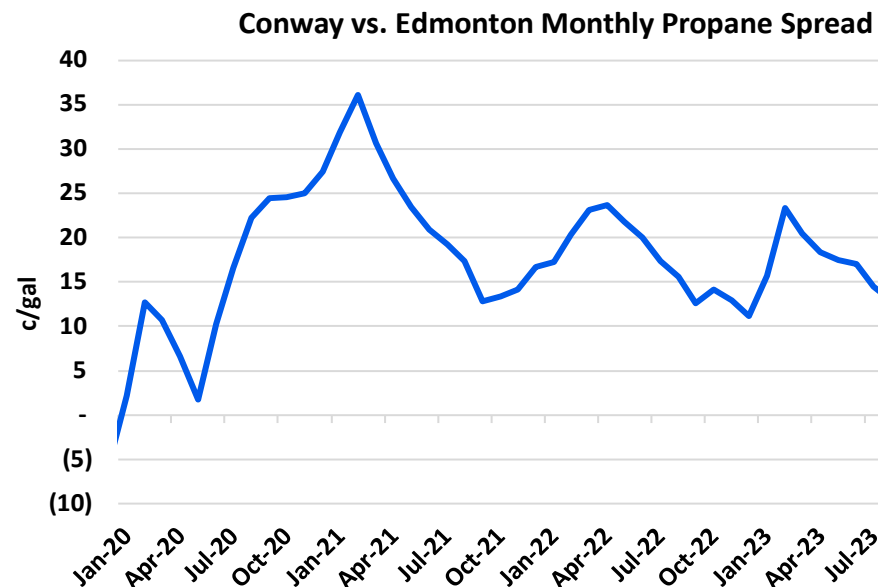
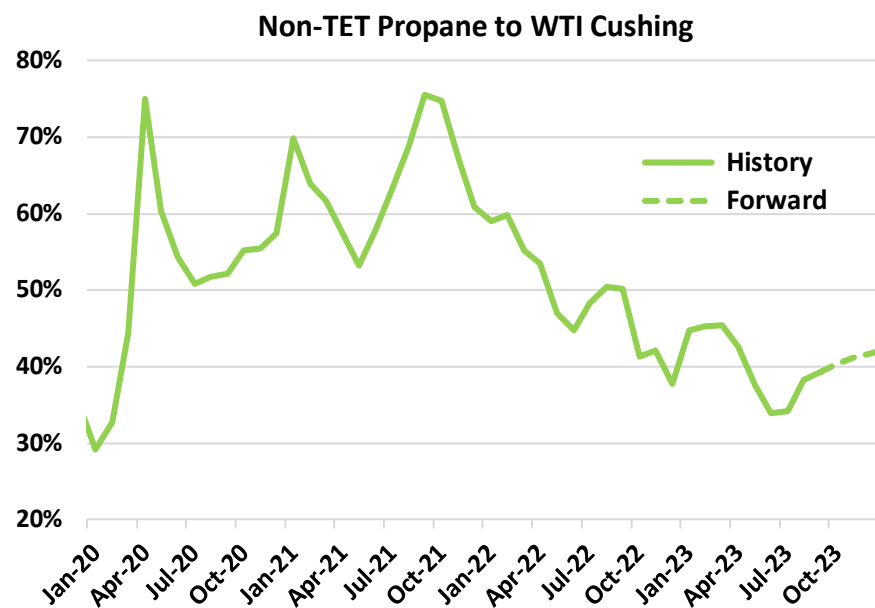


Figure 8.5



| Table L: MB TET Propane / WTI Cushing |       |       |       |       |        |
|---------------------------------------|-------|-------|-------|-------|--------|
| %                                     | 2020  | 2021  | 2022  | 2023  | Y/Y %  |
| May                                   | 59.1% | 53.2% | 47.3% | 38.1% | -19.4% |
| Jun                                   | 54.8% | 56.9% | 44.8% | 34.3% | -23.5% |
| Jul                                   | 50.0% | 63.3% | 48.4% | 35.0% | -27.8% |
| Q1                                    | 36.6% | 65.8% | 58.3% | 45.0% | -22.9% |
| Q2                                    | 60.5% | 55.5% | 48.8% | 38.4% | -21.3% |
| Q3                                    | 50.6% | 69.2% | 49.5% | 35.0% | -29.4% |
| Q4                                    | 56.0% | 67.7% | 40.8% |       |        |
| Year                                  | 51.0% | 64.6% | 49.3% | 40.7% | -17.5% |

## INTERNATIONAL PROPANE PRICE SPREADS

Figure 9.1

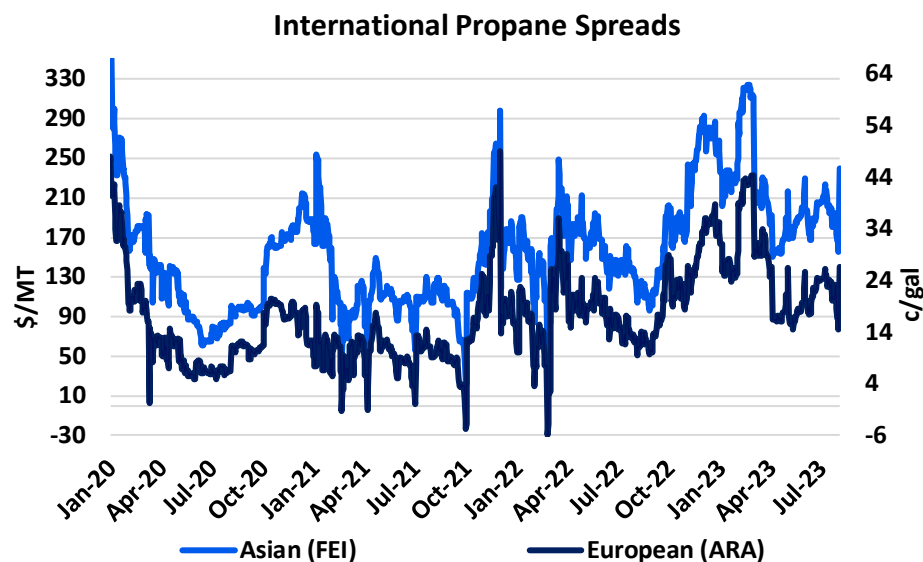
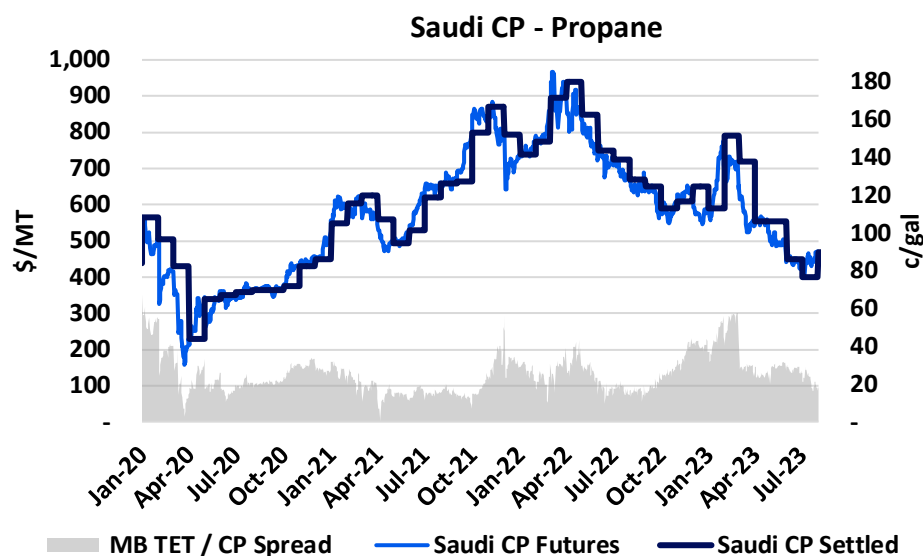


Figure 9.2



| Table M: Asian FEI / MB TET Spread |       |       |       |       |       |
|------------------------------------|-------|-------|-------|-------|-------|
| \$/MT                              | 2020  | 2021  | 2022  | 2023  | Y/Y % |
| May                                | 96.9  | 108.1 | 172.8 | 187.3 | 8.4%  |
| Jun                                | 70.1  | 97.5  | 143.2 | 191.0 | 33.3% |
| Jul                                | 78.9  | 109.7 | 140.4 | 194.4 | 38.5% |
| Q1                                 | 192.9 | 129.5 | 151.5 | 247.9 | 63.6% |
| Q2                                 | 97.6  | 106.1 | 163.8 | 181.5 | 10.8% |
| Q3                                 | 91.0  | 101.1 | 134.0 | 194.4 | 45.0% |
| Q4                                 | 175.0 | 163.6 | 232.5 |       |       |
| Year                               | 139.1 | 125.1 | 170.6 | 211.7 | 24.1% |

| Table N: European ARA / MB TET Spread |       |       |       |       |        |
|---------------------------------------|-------|-------|-------|-------|--------|
| \$/MT                                 | 2020  | 2021  | 2022  | 2023  | Y/Y %  |
| May                                   | 37.0  | 53.0  | 106.3 | 95.5  | -10.1% |
| Jun                                   | 37.6  | 38.4  | 89.2  | 112.9 | 26.6%  |
| Jul                                   | 34.9  | 60.9  | 73.3  | 116.6 | 59.1%  |
| Q1                                    | 121.6 | 53.5  | 90.5  | 171.3 | 89.2%  |
| Q2                                    | 44.8  | 50.7  | 98.3  | 101.5 | 3.2%   |
| Q3                                    | 49.8  | 48.3  | 79.3  | 116.6 | 47.1%  |
| Q4                                    | 89.5  | 111.3 | 147.9 |       |        |
| Year                                  | 76.4  | 66.0  | 104.1 | 133.4 | 28.1%  |

| Table O: Saudi CP / MB TET Spread |       |       |       |       |       |
|-----------------------------------|-------|-------|-------|-------|-------|
| \$/MT                             | 2020  | 2021  | 2022  | 2023  | Y/Y % |
| May                               | 105.3 | 75.1  | 140.0 | 154.7 | 10.5% |
| Jun                               | 81.3  | 84.1  | 91.1  | 145.0 | 59.1% |
| Jul                               | 106.0 | 79.2  | 91.6  | 114.4 | 25.0% |
| Q1                                | 189.7 | 118.4 | 136.5 | 216.9 | 58.9% |
| Q2                                | 103.4 | 74.8  | 135.3 | 142.9 | 5.6%  |
| Q3                                | 107.5 | 77.5  | 91.6  | 114.4 | 24.9% |
| Q4                                | 150.0 | 144.3 | 178.4 |       |       |
| Year                              | 137.6 | 103.7 | 135.4 | 169.8 | 25.4% |

## U.S. PROPANE SUPPLY &amp; DEMAND BALANCE DETAIL

| Table P:                 | MM gal / month |              |              |              |              |              |              | M bbl / day   |               |               |               |               |               |               |
|--------------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                          | EIA MONTHLY    |              | ESTIMATED    |              | FORECAST     |              |              | EIA MONTHLY   |               | ESTIMATED     |               | FORECAST      |               |               |
|                          | Apr-23         | May-23       | Jun-23       | Jul-23       | Aug-23       | Sep-23       | Oct-23       | Apr-23        | May-23        | Jun-23        | Jul-23        | Aug-23        | Sep-23        | Oct-23        |
| Gas Processing           | 2,465          | 2,577        | 2,505        | 2,599        | 2,605        | 2,531        | 2,623        | 1,956         | 1,979         | 1,988         | 1,996         | 2,001         | 2,009         | 2,015         |
| Refinery Propane         | 360            | 375          | 373          | 390          | 383          | 363          | 373          | 286           | 288           | 296           | 299           | 294           | 288           | 286           |
| Imports                  | 101            | 86           | 89           | 88           | 86           | 86           | 109          | 80            | 66            | 70            | 68            | 66            | 68            | 84            |
| <b>TOTAL SUPPLY</b>      | <b>2,926</b>   | <b>3,038</b> | <b>2,966</b> | <b>3,077</b> | <b>3,074</b> | <b>2,980</b> | <b>3,105</b> | <b>2,322</b>  | <b>2,333</b>  | <b>2,354</b>  | <b>2,364</b>  | <b>2,361</b>  | <b>2,365</b>  | <b>2,385</b>  |
| Product Supplied         | 873            | 680          | 702          | 758          | 847          | 981          | 1,060        | 693           | 522           | 557           | 582           | 650           | 779           | 814           |
| ResCom                   | 504            | 397          | 384          | 385          | 326          | 344          | 477          | 400           | 305           | 305           | 295           | 251           | 273           | 367           |
| Crop Drying              | 39             | 39           | 39           | 39           | 80           | 128          | 215          | 31            | 30            | 31            | 30            | 62            | 102           | 165           |
| Industrial               | 82             | 84           | 90           | 94           | 91           | 89           | 96           | 65            | 64            | 72            | 72            | 70            | 71            | 73            |
| Petrochemicals           | 226            | 228          | 201          | 208          | 224          | 203          | 209          | 180           | 175           | 160           | 160           | 172           | 161           | 161           |
| PDH                      | 76             | 85           | 88           | 104          | 111          | 113          | 117          | 60            | 65            | 70            | 80            | 85            | 90            | 90            |
| Balancing                | (54)           | (152)        | (101)        | (71)         | 15           | 103          | (55)         | (43)          | (117)         | (80)          | (55)          | 12            | 82            | (42)          |
| Exports                  | 1,846          | 1,927        | 1,891        | 2,029        | 2,023        | 1,942        | 2,010        | 1,465         | 1,480         | 1,501         | 1,559         | 1,554         | 1,541         | 1,544         |
| <b>Stock Change</b>      | <b>208</b>     | <b>432</b>   | <b>372</b>   | <b>290</b>   | <b>204</b>   | <b>57</b>    | <b>34</b>    | <b>165</b>    | <b>332</b>    | <b>295</b>    | <b>223</b>    | <b>157</b>    | <b>45</b>     | <b>26</b>     |
| <b>TOTAL DISPOSITION</b> | <b>2,927</b>   | <b>3,039</b> | <b>2,965</b> | <b>3,078</b> | <b>3,074</b> | <b>2,980</b> | <b>3,105</b> | <b>2,323</b>  | <b>2,334</b>  | <b>2,353</b>  | <b>2,364</b>  | <b>2,361</b>  | <b>2,365</b>  | <b>2,385</b>  |
| <b>TOTAL INVENTORY</b>   | <b>2,551</b>   | <b>2,984</b> | <b>3,356</b> | <b>3,646</b> | <b>3,851</b> | <b>3,907</b> | <b>3,942</b> | <b>60,734</b> | <b>71,047</b> | <b>79,905</b> | <b>86,815</b> | <b>91,680</b> | <b>93,031</b> | <b>93,845</b> |
| Last Year Inventory      | 1,688          | 2,085        | 2,272        | 2,693        | 3,054        | 3,439        | 3,638        | 40,185        | 49,644        | 54,099        | 64,130        | 72,704        | 81,876        | 86,612        |
| <b>Stock M/M Δ</b>       | <b>208</b>     | <b>432</b>   | <b>372</b>   | <b>290</b>   | <b>204</b>   | <b>57</b>    | <b>34</b>    | <b>4,950</b>  | <b>10,292</b> | <b>8,858</b>  | <b>6,911</b>  | <b>4,865</b>  | <b>1,351</b>  | <b>814</b>    |
| Last Year Stock M/M Δ    | 165            | 397          | 188          | 419          | 361          | 386          | 201          | 3,930         | 9,455         | 4,470         | 9,982         | 8,587         | 9,180         | 4,774         |

\* Inventories are shown in billion gallons and million barrels respectively.

## PADD AVERAGE HEATING DEGREE DAYS (HDDs)

Figure 10.1

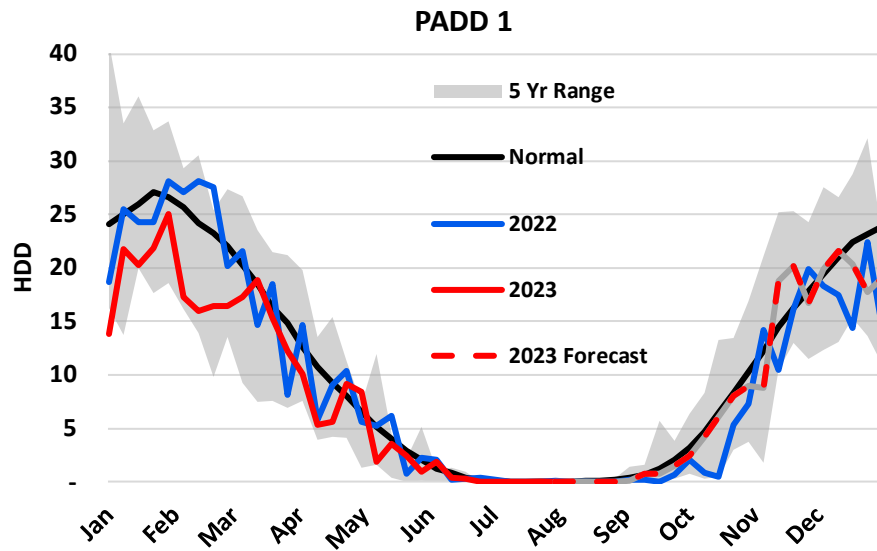


Figure 10.2

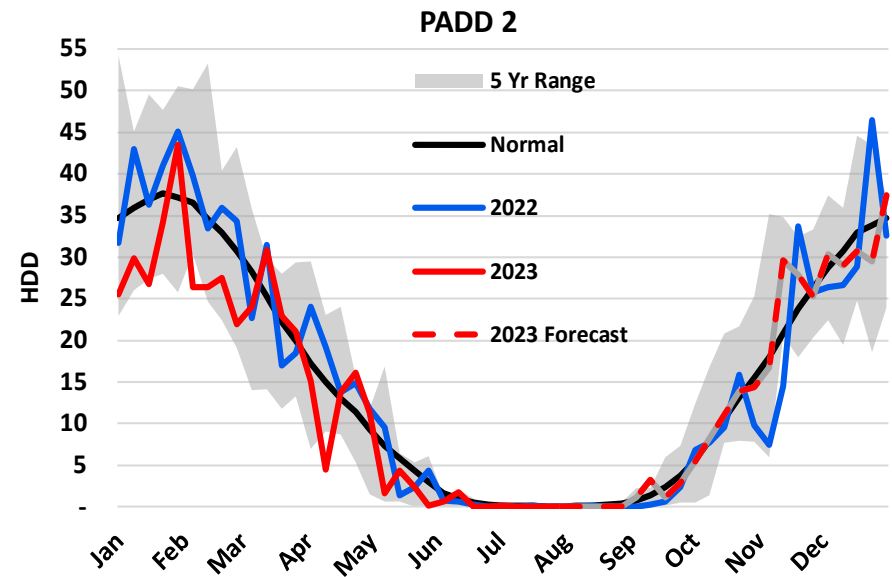


Figure 10.3

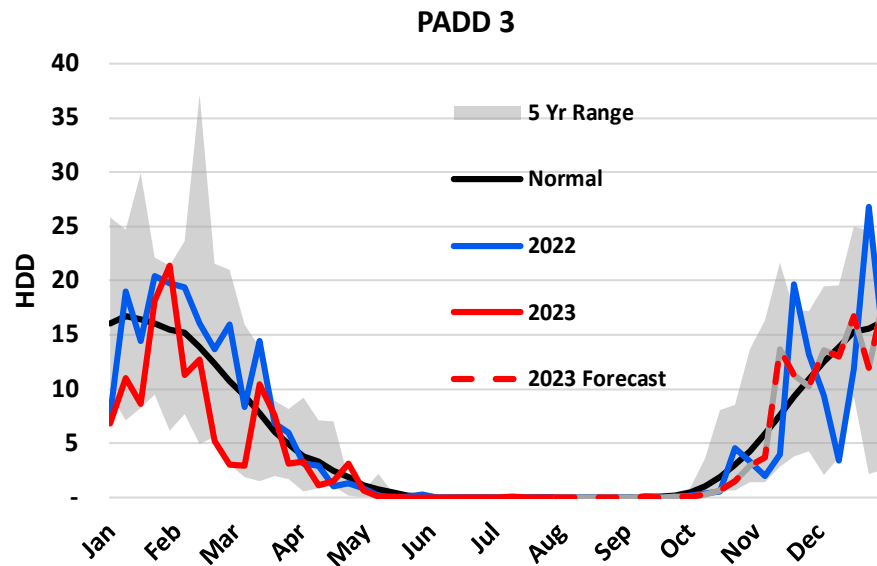




Figure 10.4

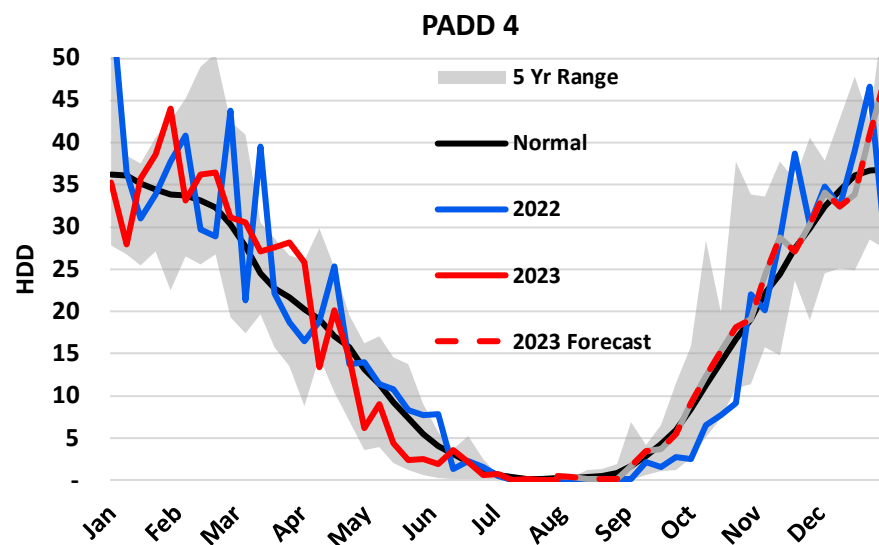
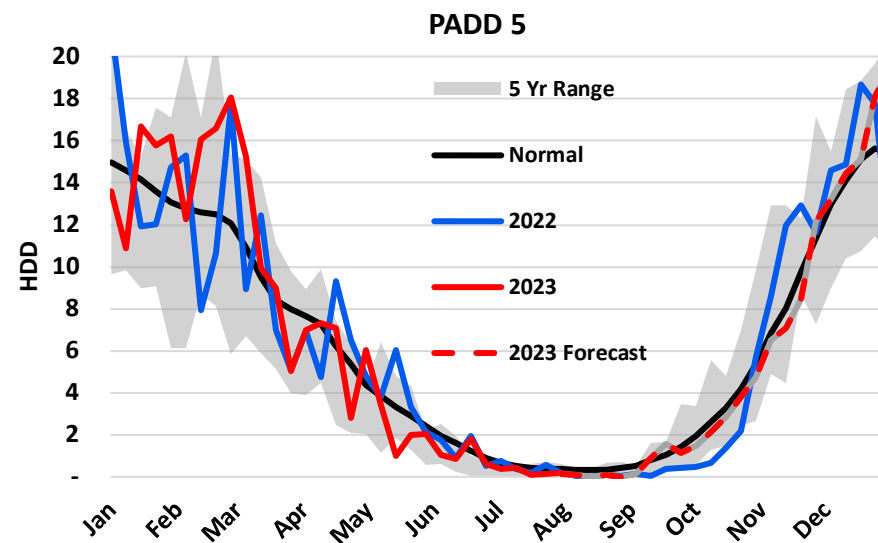


Figure 10.5



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