



RBN U.S. Propane Billboard

U.S. Propane Market Update & Outlook

For questions, please email trout@rbnenergy.com; Follow on Twitter @RBNEnergy

September 6, 2023

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U.S. PROPANE SUPPLY & DEMAND

Table A:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Production	2,952	2,946	3,055	3,072	2,970	3,070	2,975	2,267	2,338	2,347	2,360	2,357	2,358	2,361
Gas Plants	2,577	2,588	2,682	2,691	2,610	2,701	2,619	1,979	2,054	2,060	2,067	2,071	2,075	2,078
Refinery	375	358	373	381	360	368	356	288	284	287	293	286	283	283
Imports	86	89	88	96	82	109	125	66	71	68	74	65	84	100
TOTAL SUPPLY	3,038	3,035	3,144	3,168	3,052	3,178	3,100	2,333	2,409	2,414	2,433	2,422	2,441	2,460
Demand (Prod. Supplied)	678	803	821	784	998	1,090	1,218	521	637	630	602	792	837	967
Exports	1,927	1,891	2,010	2,061	1,971	2,058	1,982	1,480	1,501	1,544	1,583	1,565	1,581	1,573
Stock Change	432	340	313	323	83	30	(101)	332	270	240	248	66	23	(80)
TOTAL DISPOSITION	3,038	3,034	3,143	3,168	3,052	3,178	3,100	2,333	2,408	2,414	2,434	2,422	2,441	2,460
TOTAL INVENTORY*	3.0	3.3	3.6	4.0	4.0	4.1	4.0	71.0	79.1	86.6	94.3	96.3	97.0	94.6

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

MONTHLY HIGHLIGHTS

- U.S. propane production soared to an all-time high for a second consecutive month, according to the latest EIA data released August 31. Gas plant production for June rocketed to 2,054 Mb/d, which was 75 Mb/d, or 3.9%, above May's record rate and 191 Mb/d, or 10.3%, higher than June 2022. Most of the supply gain was seen in PADD 3, which increased sharply by 62 Mb/d to a new record. (See the Monthly Market Spotlight section of this report, where we review the strong growth in U.S. propane production.)
- Propane exports were strong in August at 1,583 Mb/d, which was 202 Mb/d, or 14.6%, higher than the rate for the same month last year. The U.S.-Asia export arbitrage for propane remained open (economical) as Asia FEI prices moved higher while Mont Belvieu prices were relatively flat. Gulf Coast propane export terminal resale values (terminaling rates) doubled during the month to 14 c/gal for second-half of September loadings. U.S. LPG export capacity continues to be tight and terminal resale differentials may remain elevated due to strong overseas demand.
- Total U.S. propane inventories grew by 7.7 MMbbl during August, which is about 1 MMbbl less than the increase last year and the 5-year average build. Propane stocks remain ample at 94.3 MMbbl (4 Bgal), which is 21.5 MMbbl, or 29%, above last year and 15.2 MMbbl, or 19%, higher than the 5-year average.

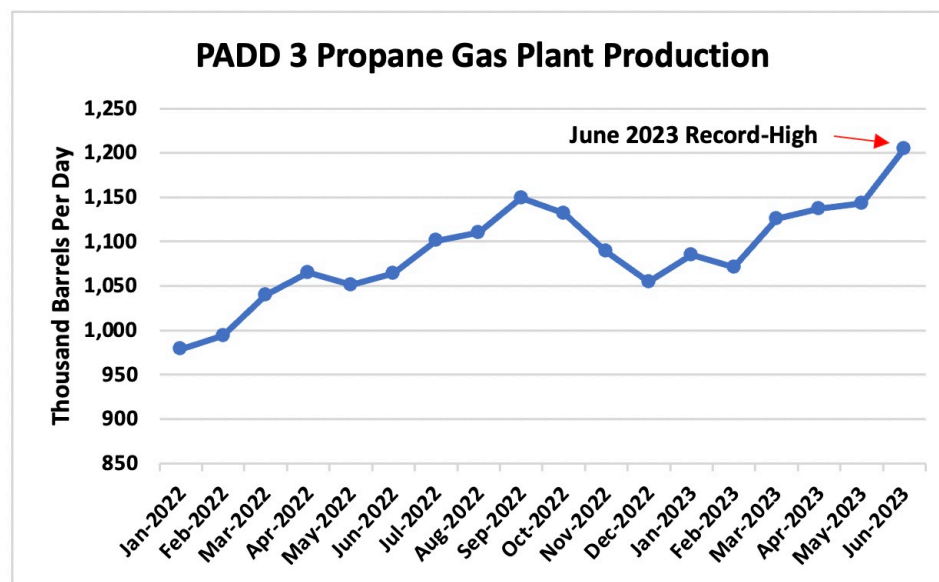
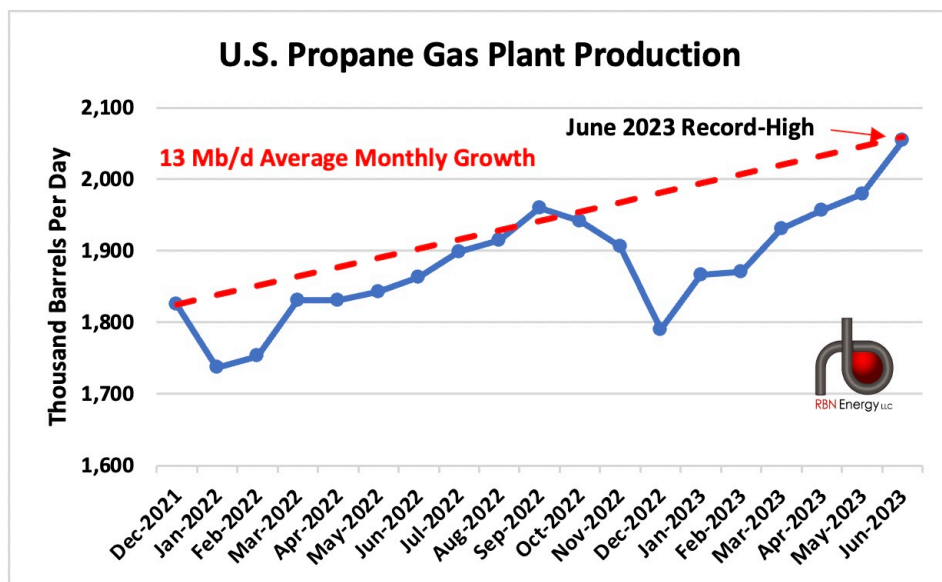
MARKET OVERVIEW

- Strong production growth and robust exports were the main market themes for this month's report. Total U.S. propane stocks remain healthy, well above last year and the 5-year average, but the cushion has gotten smaller. We estimate that inventories will end the storage injection season just below 100 MMbbl, which should be ample barring any polar vortex type of weather event. We got more strong data from the EIA on propane production, which hit a record high for the second month in a row. However, exports remain robust, absorbing the strong growth in propane supplies and balancing the market as we approach the winter heating season.

MONTHLY PROPANE MARKET SPOTLIGHT

U.S. Propane Production Soars to Another Record High

U.S. propane production rocketed to an all-time high for the second month in a row. As shown on the left-hand chart below, monthly U.S. propane gas plant production for June 2023, as reported by the EIA on August 31, increased by 75 Mb/d to 2,054 Mb/d, which was 191 Mb/d, or 10.3%, above what was recorded in June 2022. Not surprisingly, most of the increase in propane supply was in PADD 3 (Gulf Coast), which represents about 60% of total U.S. production. As shown on the right-hand chart below, Gulf Coast gas plant supply increased to 1,205 Mb/d in June, up 62 Mb/d from May. Monthly production for the region was 141 Mb/d, or 13.3%, higher than June 2022 and 56 Mb/d, or 4.9%, above the September 2022 record high for PADD 3. PADD 2 (Midwest) also set a record for the second consecutive month with production rising to 414 Mb/d, which was 6 Mb/d higher than May's all-time high. RBN's production model projects that propane supply growth will moderate from the very strong rate in June and increase by 5-10 Mb/d per month for the rest of the year, driven by growing NGL volumes out of the Permian Basin.

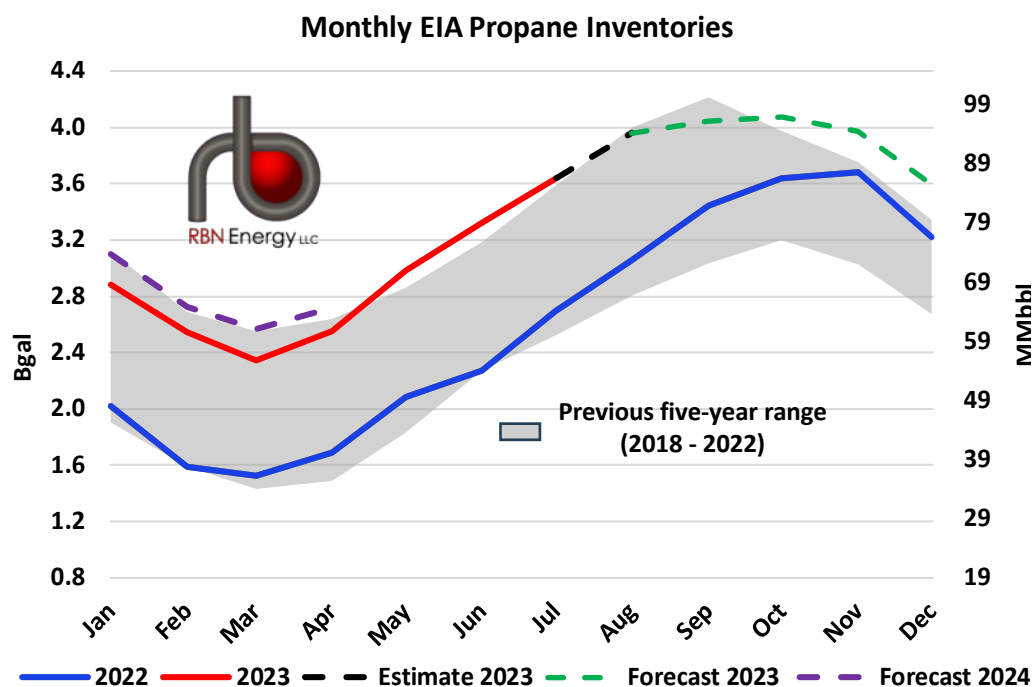


Source: EIA, RBN

U.S. PROPANE INVENTORIES

Table B:	MM gal							M bbl					
	MONTHLY EIA			ESTIMATED		FORECAST		MONTHLY EIA			ESTIMATED		FORECAST
	May-23	Jun-23	M/M	Jul-23	Aug-23	Sep-23		May-23	Jun-23	M/M	Jul-23	Aug-23	Sep-23
PADD 1 (East Coast)	220	192	(29)	274	323	344		5,243	4,561	(682)	6,532	7,701	8,189
PADD 2 (Midwest)	727	850	123	954	1,027	1,062		17,317	20,244	2,927	22,704	24,452	25,283
PADD 3 (Gulf Coast)	1,887	2,100	212	2,194	2,378	2,396		44,938	49,992	5,054	52,230	56,628	57,044
PADD 4 (Rocky Mountains)	96	112	17	133	140	145		2,279	2,673	394	3,166	3,328	3,445
PADD 5 (West Coast)	53	70	17	82	92	97		1,270	1,675	405	1,961	2,180	2,298
TOTAL PROPANE	2,984	3,324	340	3,637	3,960	4,043		71,047	79,145	8,098	86,592	94,288	96,259
Propylene	48	48	(0)	47	49	46		1,147	1,138	(9)	1,130	1,177	1,102
TOTAL INVENTORIES	3,032	3,372	340	3,684	4,010	4,089		72,194	80,283	8,089	87,722	95,465	97,360

Figure 1.1



Source: EIA, RBN Forecast

ANALYSIS & INSIGHTS

U.S. propane inventories built by 7.7 MMbbl during the fifth month of the injection season, which was below the 8.6-MMbbl build in August 2022 and the 5-year average increase for the month of 8.7 MMbbl, bringing ending stocks for August to 94.3 MMbbl (4 Bgal), which is 21.5 MMbbl, or 29%, above last year and 19% higher than the 5-year average. PADD 3 had a typical build of 4.4 MMbbl for the month, which was on par with the 4.2 MMbbl average increase for the period. Gulf Coast inventories remain elevated and are 13.3 MMbbl, or 31%, above the 5-year average. PADD 2 inventories rose by 1.8 MMbbl, which was below the 2.9 MMbbl average gain for the month. Midwest stocks are 3.1 MMbbl, or 14%, above last year and 0.7 MMbbl higher than the 5-year average. PADD 1 inventories increased by 1.2 MMbbl, which on par with the 5-year average build of 1.1 MMbbl. PADD 4 stocks rose by 162 Mbbl to 3.3 MMbbl, which is 602 Mbbl above last year and 1 MMbbl higher than the 5-year average. PADD 5 inventories increased by 219 Mbbl to 2.2 MMbbl, which is 32 Mbbl, or 1%, above the 5-year average.

INVENTORY OUTLOOK

U.S. propane inventories in September are projected to have a modest build of 2 MMbbl, which is well below the 9.1 MMbbl increase last year and the 5-year average gain of 6 MMbbl. This would bring total stocks to 96.2 MMbbl (4 Bgal), which is 14.3 MMbbl more than last year and 11.2 MMbbl above the 5-year average.

PROPANE MARKET UPDATE

MONT BELVIEU PROPANE PRICES RELATIVELY FLAT

West Texas Intermediate (WTI) prices were firmer in August, holding above \$80/bbl, as tighter supplies and stronger demand lifted market sentiment. WTI closed at \$83.63/bbl on August 31, up \$2.26/bbl, or 2.8%, from August 1.

U.S. propane prices were little changed during the month. OPIS non-LST (Enterprise, aka non-TET) propane averaged 67.3 c/gal in August, settling at 68.4 c/gal on August 31, up 0.1 c/gal from the beginning of the month. OPIS LST (Energy Transfer, aka TET) propane prices averaged 68.2 c/gal for the month, closing at 68.5 c/gal on August 31, a decline of 3.4 c/gal from the beginning of the month. The non-TET vs. TET price spread narrowed by 3.5 c/gal during the month, with non-TET trading at a discount of 0.1 c/gal on August 31. Conway OPIS propane averaged 67.1 c/gal during the month, which represented a 0.2 c/gal discount to the average non-LST price.

The benchmark propane-to-WTI Cushing ratio (Figure 1.2) settled at 34% as of August 31, down 1 percentage point from August 1. The current forward curves (Figure 1.3) project the propane-to-WTI ratio to average around 36% through November, which is 3 percentage points lower than implied by the forward curves from last month. As shown in Figure 1.3, the forward curve for September (red line) shifted down, falling by about 7-8 c/gal from the forward curve in August (yellow line).

Figure 1.2

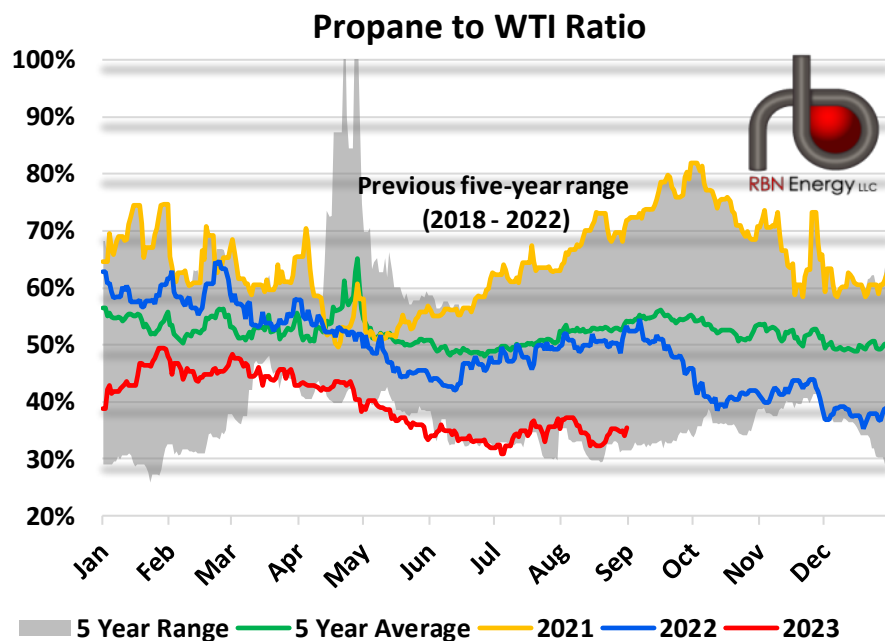
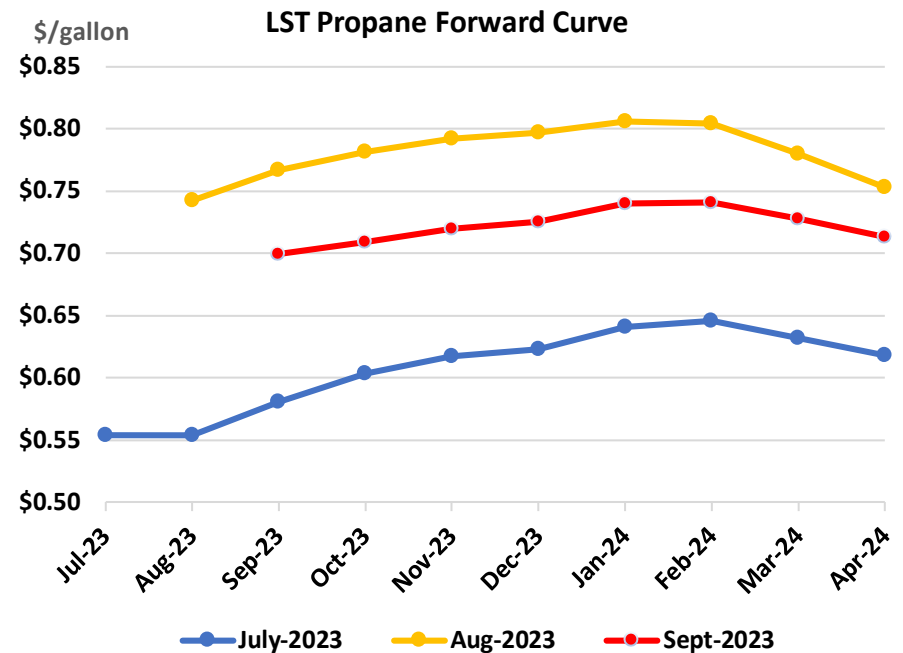


Figure 1.3



CONWAY VS. MONT BELVIEU PROPANE PRICES

Figure 2.5

CONWAY DISCOUNT TO BELVIEU NARROWS

The Conway spot propane (OPIS) average discount to Mont Belvieu (Figure 2.5) narrowed to 0.2 c/gal during August, compared to a 1.7 c/gal discount in July and a 1.6 c/gal discount in June. In August 2022, Conway was at an average discount of 1.4 c/gal while in 2018 it was at a discount of 19.4 c/gal. The 5-year average Conway discount for August is 6.4 c/gal. As of August 31, the Conway spot propane (OPIS) discount to Mont Belvieu had widened to 1.5 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 0.8 c/gal premium to Conway in September, then flip 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

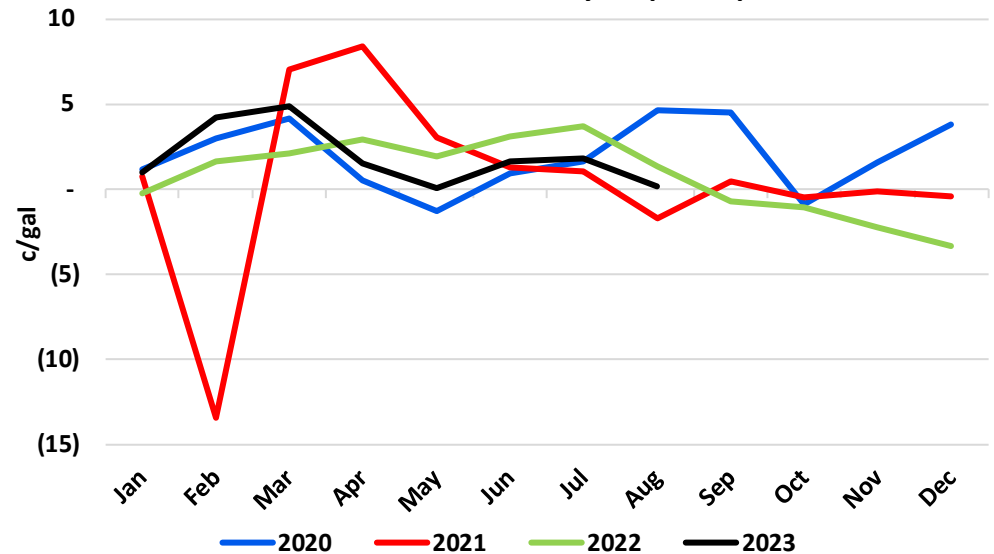
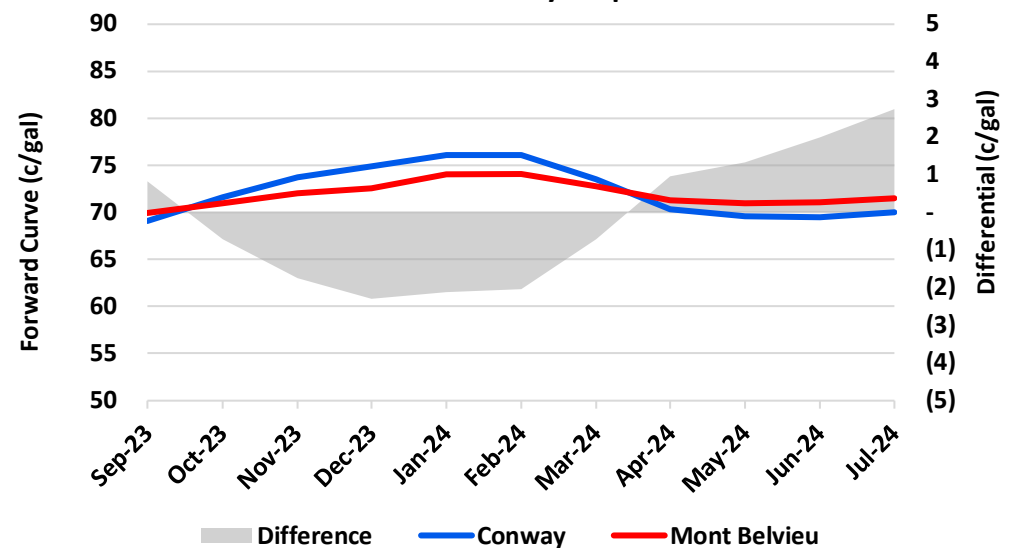


Figure 2.6

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
	May-23	Jun-23	M/M	Jul-23	Aug-23		May-23	Jun-23	M/M	Jul-23	Aug-23	
ResCom	397	329	(68)	332	333	328	305	261	(44)	255	256	260
Crop Drying	39	39	(0)	39	80	128	30	31	1	30	62	102
Industrial	84	82	(2)	94	94	89	64	65	0	72	73	71
Petrochemicals	215	199	(17)	228	228	215	165	158	(8)	175	175	171
PDH	85	82	(3)	104	111	113	65	65	-	80	85	90
Balancing	(141)	73	214	23	(62)	(128)	(108)	58	166	18	(47)	(102)
TOTAL PROPANE	678	803	124	821	784	746	521	637	116	630	602	592
Propylene	361	338	(23)	336	323	317	277	268	(9)	258	248	252
TOTAL DEMAND **	1,039	1,140	101	1,156	1,107	1,063	798	905	107	888	850	843
Weekly***	839	1,011	172	1,061	1,191		644	803	158	815	915	
Variance	(200)	(129)	71	(95)	84		(154)	(102)	51	(73)	65	

* 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 June 2023, weekly through the week of August 25, 2023.

RESIDENTIAL & COMMERCIAL

Figure 3.1 shows our forecast for Residential & Commercial ("ResCom") propane demand. ResCom demand was seasonally weak in August at 256 Mb/d (333 MMgal/m), essentially flat with July. ResCom demand for September is expected to remain low at 260 Mb/d, an increase of 4 Mb/d from August.

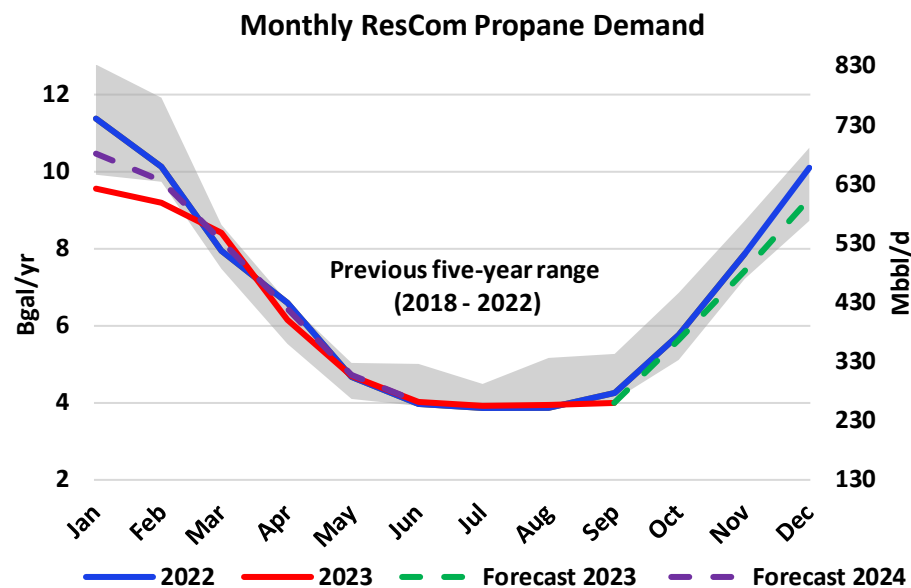
AGRICULTURAL (CROP DRYING) DEMAND OUTLOOK

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. The latest USDA crop progress report shows the current corn condition to be slightly better than last year and in line with the 5-year average.

PETROCHEMICAL DEMAND REMAINS WEAK

Steam cracker demand for propane stayed modestly higher during the month at 175 Mb/d, mainly due to reduced maintenance outages. We expect cracker demand for propane to stay weak as margins remain poor due to low olefins prices. PDH demand was stronger in August at 85 Mb/d with the ramp up of Enterprise's new PDH 2 unit (35 Mb/d propane).

Figure 3.1



Source: RBN Estimate

U.S. PROPANE EXPORTS

Table D: U.S. Propane Exports Monthly and Weekly*						
(Mbbbl/d)	MONTHLY EIA			ESTIMATED		FORECAST
	May-23	Jun-23	M/M	Jul-23	Aug-23	Sep-23
Gulf Coast	1,263	1,275	12	1,332	1,343	1,360
East Coast	188	182	(6)	176	205	175
West Coast	23	40	17	30	30	25
Other	6	4	(2)	6	5	5
TOTAL EXPORTS	1,480	1,501	21	1,544	1,583	1,565
Weekly	1,475	1,539	63	1,523	1,551	
Variance	(5)	38	42	(20)	(32)	

*Monthly data from EIA through June 2023, weekly through the week of August 25, 2023.
See [RBN's NGL Voyager Report](#) for additional details on propane exports.

EAST COAST EXPORTS

East Coast propane exports from Energy Transfer's Marcus Hook terminal in Pennsylvania were strong at 205 Mb/d in August, up 29 Mb/d from July. PADD 1 exports are expected to moderate in September to 175 Mb/d, which is 25 Mb/d higher than September 2022. East Coast exports (green bars in Figure

4.1) are projected to grow at a good rate in 2023, averaging 154 Mb/d, up 20 Mb/d, or 14.9%, from 2022. No propane cargoes were imported into the Newington, NH, or Providence, RI, terminals in August. We expect that 3-4 cargoes will be imported into the Northeast during the upcoming winter heating season, similar to last year.

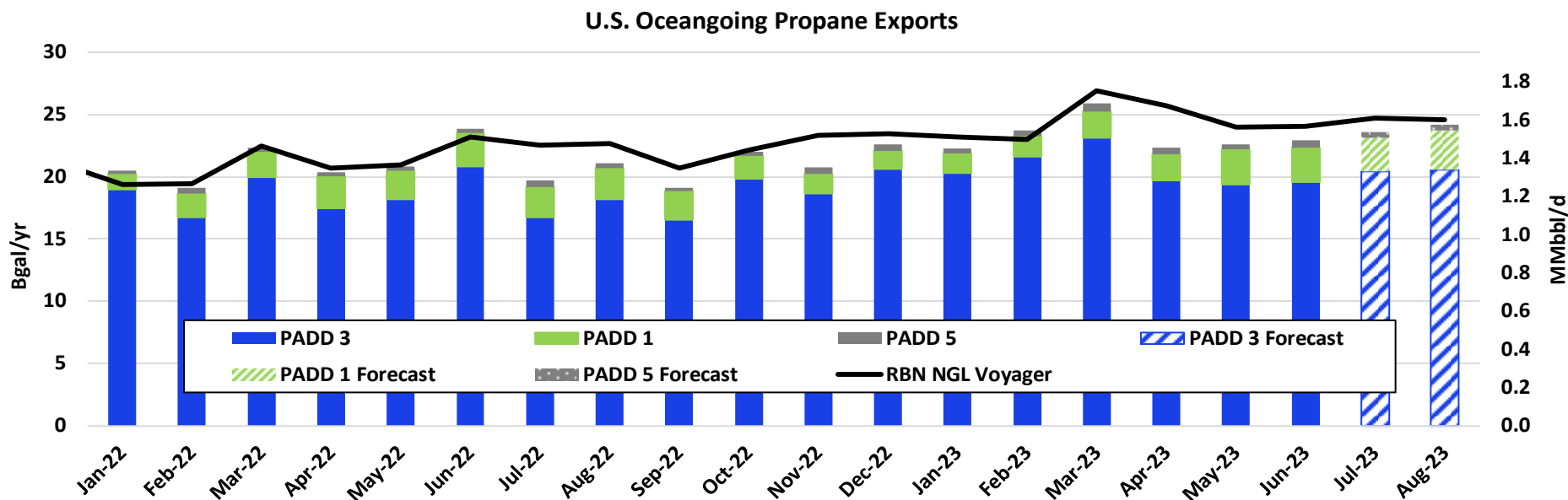
GULF COAST EXPORTS

Gulf Coast propane exports were modestly higher in August at 1,343 Mb/d, up 11 Mb/d from July and 155 Mb/d higher than August 2022. For September, we expect PADD 3 exports to inch up to 1,360 Mb/d. Gulf Coast exports (blue bars in Figure 4.1) are forecast to grow at a healthy clip in 2023, averaging 1,359 Mb/d, up 148 Mb/d, or 12%, from 2022.

WEST COAST EXPORTS

On the West Coast, propane exports were unchanged from July at 30 Mb/d (gray bars in Figure 4.1). PADD 5 exports are expected to decline to 25 Mb/d in September and average 31 Mb/d for 2023, up 4 Mb/d from last year. All West Coast exports are destined for Asia (via the AltaGas Ferndale, WA, terminal) or Mexico (railcars/trucks).

Figure 4.1



Source: EIA, RBN Forecast

INTERNATIONAL PROPANE

Figure 4.2

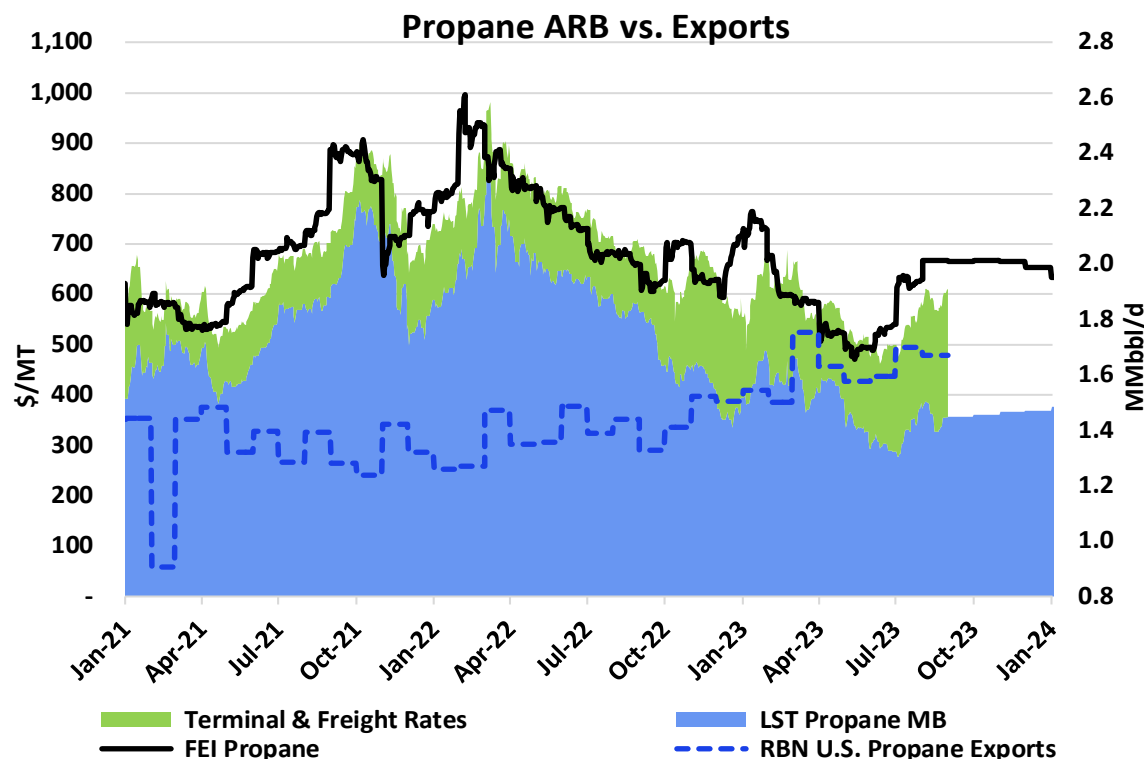
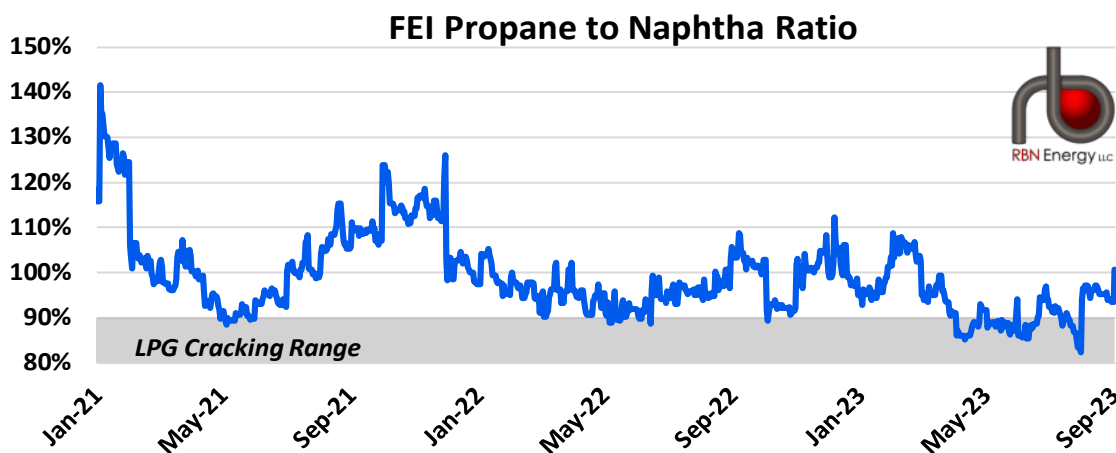


Figure 4.3



U.S.-ASIA EXPORT ARB REMAINS OPEN

Saudi Aramco increased its September LPG contract prices (CP) for propane to \$550/MT (105.6 c/gal) and butane to \$560/MT (123.6 c/gal), up \$80/MT (15.4 c/gal) and \$100/MT (22.1 c/gal), respectively, from the August CPs.

VLGC freight rates were stronger in August. Spot VLGC freight rates from the U.S. Gulf Coast to Chiba, Japan, (via Panama Canal) increased by \$16.5/MT to \$182.5/MT as of August 31, which is 9.9% above the rate on August 1. Congestion at the Panama Canal was volatile during the month, with wait times falling to four days northbound and three days southbound as of August 31. Spot terminal fees soared during the month, averaging 14 c/gal for H2 September-H1 October loadings on August 31.

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 four weeks, the LST propane price at Mont Belvieu increased by \$29/MT to close at \$355/MT, or 68.2 c/gal, on August 31, while the September FEI propane forward curve increased by \$50/MT, which resulted in a slightly wider spread between U.S. and Asian prices. Thus, the arb for September-October increased to \$310/MT, or 59 c/gal, as of August 31. Taking into consideration terminal fees and freight costs, the arb for September-October was open (negative, thus economic) at minus \$54/MT, or minus 10.4 c/gal.

Figure 4.3 shows the ratio of the Asian FEI propane price to naphtha in the same region. On September 1, the ratio increased to 101%, which implies that Asian crackers will tend to favor naphtha feedstock over propane.

U.S. PROPANE PRODUCTION

Figure 5.1

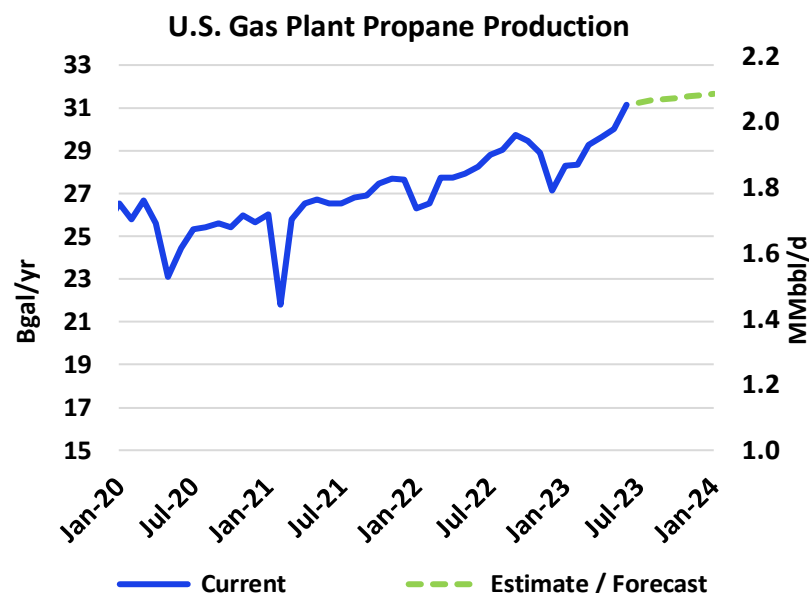


Figure 5.2

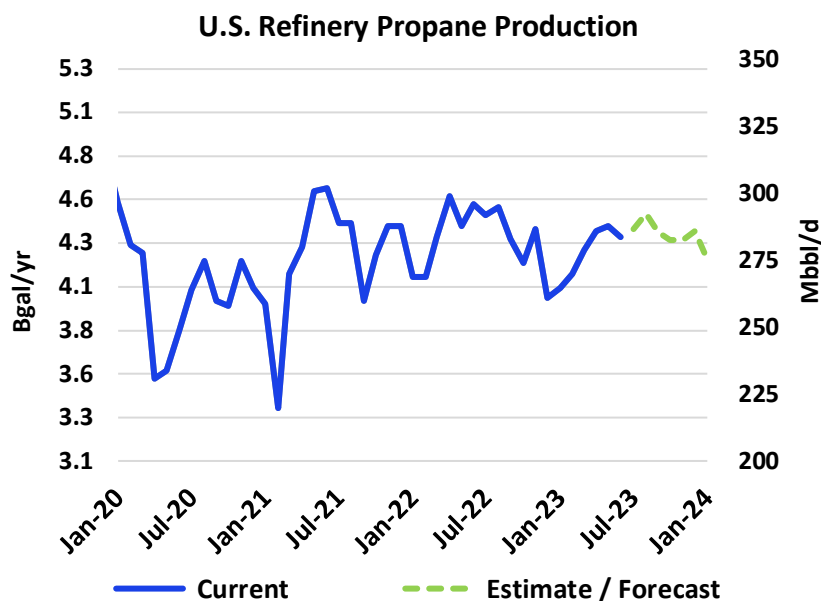


Table E: U.S. Propane Production Monthly and Weekly*						
(Mbbbl/d)	MONTHLY EIA			ESTIMATED		FORECAST
	May-23	Jun-23	M/M	Jul-23	Aug-23	Sep-23
Gas Plant	1,979	2,054	75	2,060	2,067	2,071
Refinery	288	284	(4)	287	293	286
TOTAL PROPANE	2,267	2,338	71	2,347	2,360	2,357
Propylene	256	251	(5)	243	235	236
TOTAL PRODUCTION	2,523	2,589	66	2,589	2,595	2,593
Weekly**	2,483	2,557	75	2,524	2,622	
Variance	(41)	(32)	9	(65)	28	

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

** Monthly production from EIA through June 2023, weekly through the week of August 25, 2023.

PROPANE GAS PLANT PRODUCTION SOARS TO ALL-TIME HIGH

Propane gas plant production for June, as reported in the EIA Petroleum Supply Monthly issued August 31, came in strong, increasing 75 Mb/d from May's record rate. Total U.S. propane production for June was 2,054 Mb/d, up 191 Mb/d, or 10.3%, from June 2022. PADD 3 production for the month was also a record high at 1,205 Mb/d, up 62 Mb/d from May and 56 Mb/d above the prior all-time high. We estimate August gas plant production at 2,067 Mb/d, an increase of 7 Mb/d from July. Our forecast model projects gas plant production will grow in September to 2,071 Mb/d, which is 17 Mb/d above the June high. For 2023, we have increased our production outlook by 36 Mb/d to 2,008 Mb/d, up 151 Mb/d, or 8.2%, 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.

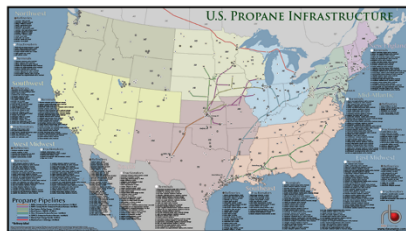
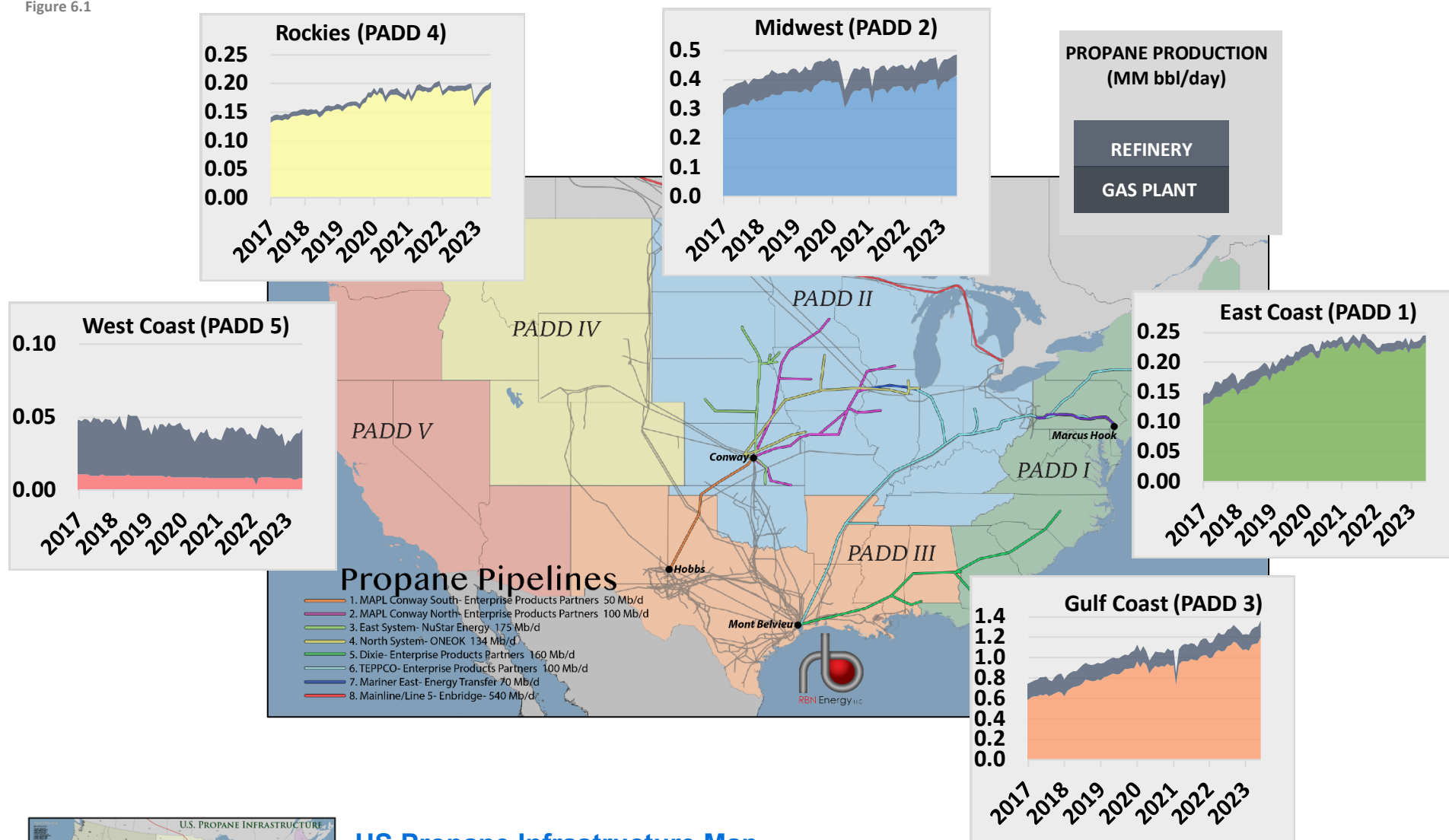
REFINERY PRODUCTION MODESTLY HIGHER

August refinery propane production increased by 6 Mb/d to 293 Mb/d as capacity utilization rose by 1 percentage point to 94%. We forecast that production in September will decline to 285 Mb/d as refinery operating rates fall back to about 92%. For 2023, we expect refinery propane production will be relatively flat and average 282 Mb/d for the year, down 1 Mb/d from 2022, due to slightly lower utilization.

Source: EIA, RBN Forecast

U.S. PROPANE INFRASTRUCTURE MAP

Figure 6.1

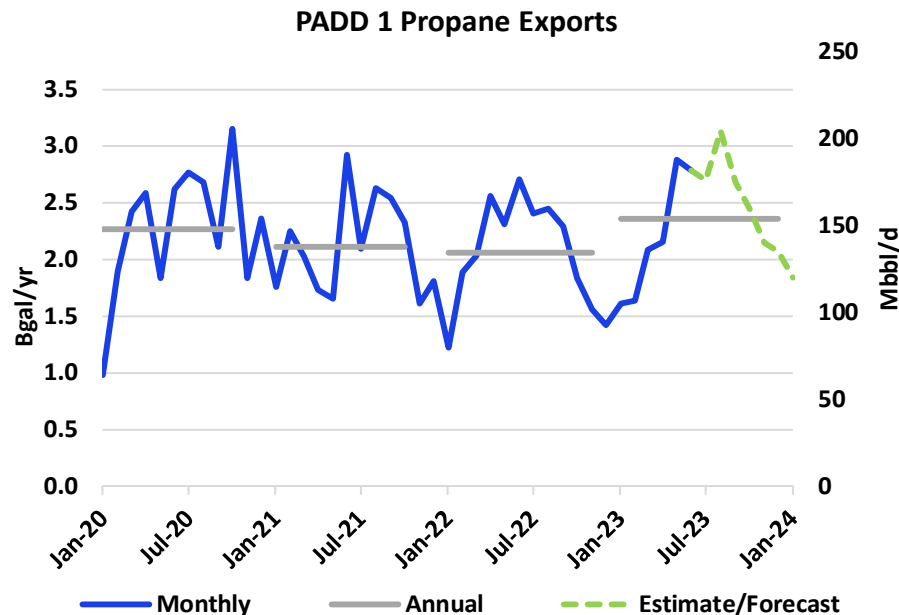
[US Propane Infrastructure Map](#)

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 & DEMAND

Table F:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Production	319	309	323	324	315	327	318	245	245	248	249	250	251	252
Gas Plants	301	295	308	305	297	308	299	231	234	236	234	236	237	238
Refinery	18	14	16	19	19	19	18	14	11	12	15	15	15	15
Imports	10	10	9	9	23	24	45	8	8	7	7	19	19	36
Net Inter-PADD Transfers	230	224	280	276	210	223	235	177	178	215	212	166	171	187
TOTAL SUPPLY	560	543	612	609	548	574	598	430	431	470	468	435	441	474
Demand (Prod. Supplied)	332	344	300	293	307	357	418	255	273	230	225	244	274	332
Exports	245	229	229	267	221	208	177	188	182	176	205	175	160	140
Stock Change	(16)	(29)	83	49	20	9	3	(12)	(23)	64	38	16	7	2
TOTAL DISPOSITION	561	544	612	609	548	574	598	431	432	470	468	435	441	474
TOTAL INVENTORY	220	192	274	323	344	353	356	5,243	4,561	6,532	7,701	8,189	8,412	8,475

Figure 7.1



Source: EIA, RBN Forecast

INSIGHTS & ANALYSIS

PADD 1 (East Coast) had a strong gain in stocks of 1.2 MMbbl for August, which was above the 82-Mbbl increase last year and in line with the 5-year average build of 1.1 MMbbl. Lower demand (product supplied) and higher inter-PADD receipts were the primary reason for the strong build. This puts PADD 1 inventory at 7.7 MMbbl (323 MMgal), which is 1 MMbbl above August 2022 and 141 Mbbl higher than the 5-year average. Exports were robust at 205 Mb/d, up 29 Mb/d from July and 57 Mb/d higher than the 2023 year-to-date average. Gas plant production in the Northeast was slightly weaker, declining by 2 Mb/d to 234 Mb/d.

PADD 1 OUTLOOK

Our propane model estimates East Coast inventories will increase by 488 Mbbl in September to 8.2 MMbbl (344 MMgal), leaving stocks 545 Mbbl above last year and in line with the 5-year average. As shown in Figure 7.1, East Coast exports are expected to weaken in September to 175 Mb/d, which is 20 Mb/d above the year-to-date average rate and 25 Mb/d higher than September 2022. Exports are projected to average 154 Mb/d for 2023, an increase of 20 Mb/d from last year.

PADD 2: PROPANE SUPPLY & DEMAND

Table G:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Production	628	614	636	634	615	635	614	482	487	488	487	488	488	487
Gas Plants	531	522	540	534	523	541	524	408	414	414	410	415	415	416
Refinery	96	92	96	100	92	94	90	74	73	74	77	73	72	71
Imports	26	39	36	44	17	37	27	20	31	28	34	14	29	22
Net Inter-PADD Transfers	(466)	(425)	(462)	(511)	(394)	(352)	(300)	(358)	(337)	(355)	(392)	(313)	(270)	(238)
TOTAL SUPPLY	187	228	210	167	239	320	341	144	181	161	128	189	246	270
Demand (Prod. Supplied)	9	100	99	87	198	305	326	7	79	76	67	157	235	259
Exports	8	5	7	7	6	5	4	6	4	6	5	5	4	3
Stock Change	171	123	103	73	35	9	11	131	98	79	56	28	7	9
TOTAL DISPOSITION	187	228	210	167	239	320	341	144	181	161	128	189	246	270
TOTAL INVENTORY	727	850	954	1,027	1,062	1,071	1,082	17,317	20,244	22,704	24,452	25,283	25,506	25,761

INSIGHTS & ANALYSIS

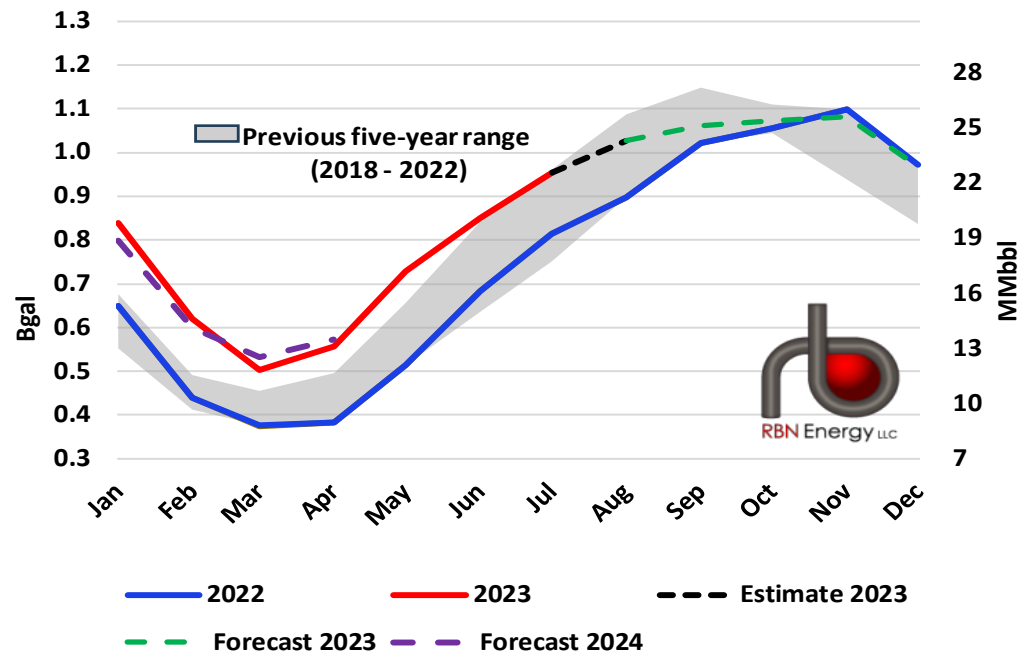
PADD 2 (Midwest) inventories built by 1.8 MMbbl during August, which was below the 2-MMbbl increase last year and the 5-year average build of 2.9 MMbbl, with stocks ending at 24.5 MMbbl (1,062 MMgal). The Midwest market is in a more comfortable supply position compared to last year with 3.1 MMbbl more in storage. Total production was relatively flat in August at 487 Mb/d. Imports increased by 6 Mb/d to 34 Mb/d, which is 1 Mb/d more than last August but 11 Mb/d below the 2022 average rate.

PADD 2 OUTLOOK

Midwest inventories are forecast to build by 0.8 Mbbl in September compared to a 5-year average increase of 2.1 MMbbl, bringing ending inventories to 25.3 MMbbl (1,071 MMgal), 1 MMbbl higher than last year but 0.6 MMbbl below the 5-year average. Canadian imports into the Midwest are projected to average 29 Mb/d in 2023, down 16 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

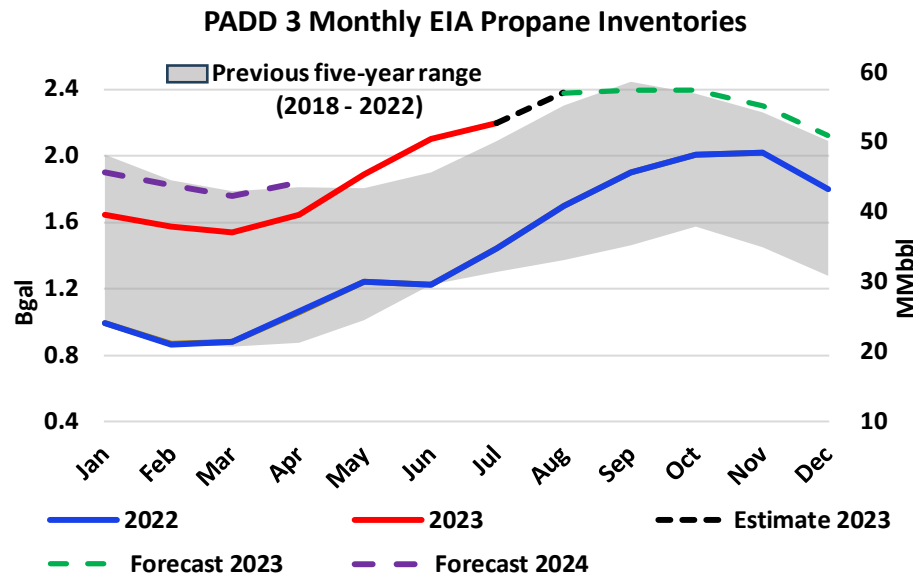


Source: EIA, RBN Forecast

PADD 3: PROPANE SUPPLY & DEMAND

Table H:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Production	1,700	1,717	1,783	1,801	1,738	1,797	1,742	1,306	1,363	1,370	1,383	1,379	1,380	1,383
Gas Plants	1,488	1,518	1,575	1,590	1,537	1,591	1,543	1,143	1,205	1,209	1,221	1,220	1,222	1,224
Refinery	212	199	208	211	200	206	200	163	158	160	162	159	158	158
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Inter-PADD Transfers	421	402	379	438	370	325	256	323	319	291	337	293	250	203
TOTAL SUPPLY	2,121	2,119	2,162	2,239	2,107	2,123	1,999	1,629	1,682	1,661	1,720	1,673	1,630	1,586
Demand (Prod. Supplied)	238	301	334	306	376	312	329	183	239	257	235	299	240	261
Exports	1,644	1,607	1,734	1,749	1,714	1,810	1,764	1,263	1,275	1,332	1,343	1,360	1,390	1,400
Stock Change	240	212	94	185	18	1	(94)	184	168	72	142	14	1	(75)
TOTAL DISPOSITION	2,122	2,119	2,162	2,239	2,107	2,123	1,999	1,630	1,682	1,661	1,720	1,673	1,630	1,586
TOTAL INVENTORY	1,887	2,100	2,194	2,378	2,396	2,397	2,302	44,938	49,992	52,230	56,628	57,044	57,063	54,817

Figure 7.3



Source: EIA, RBN Forecast

INSIGHTS & ANALYSIS

PADD 3 had a stock increase of 4.4 MMbbl for the month, which was below the 6-MMbbl build in August 2022 and in line with the average gain for the month of 4.2 MMbbl. The build brought Gulf Coast inventories to 56.6 MMbbl (2.4 Bgal) at month's end, 16.3 MMbbl higher than last year and 13.3 MMbbl, or 31%, above the 5-year average. Propane exports from the Gulf Coast were modestly higher at 1,343 Mb/d, up 11 Mb/d from July and 251 Mb/d higher than in August 2022. PADD 3 gas plant production increased to 1,221 Mb/d in August, up 12 Mb/d from July and 16 Mb/d above the record high in June 2023.

PADD 3 OUTLOOK

September inventories are forecast to build at a low rate as exports remain strong and domestic demand improves, rising by only 417 Mbbl, which is below the 5-year average build of 4.2 Mbbl. That would leave September ending stocks at 57 MMbbl (2.4 Bgal), which is 11.9 MMbbl more than last year and 10.9 MMbbl above the 5-year average. Gulf Coast propane production is expected to remain nearly flat in September at 1,220 Mb/d, which is 71 Mb/d above September 2022.

PADD 4: PROPANE SUPPLY & DEMAND

Table I:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Production	254	253	260	260	252	260	252	195	201	200	200	200	200	200
Gas Plants	246	243	251	251	243	251	243	189	193	193	193	193	193	193
Refinery	8	10	9	9	9	9	9	6	8	7	7	7	7	7
Imports	14	11	12	12	10	13	17	11	9	9	9	8	10	14
Net Inter-PADD Transfers	(214)	(215)	(211)	(219)	(203)	(214)	(209)	(164)	(171)	(162)	(168)	(161)	(165)	(166)
TOTAL SUPPLY	55	49	61	54	59	59	60	42	39	47	41	47	45	48
Demand (Prod. Supplied)	42	32	41	47	54	61	71	32	25	31	36	43	47	56
Exports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock Change	13	16	21	7	5	(2)	(10)	10	13	16	5	4	(2)	(8)
TOTAL DISPOSITION	55	48	61	54	59	59	60	42	38	47	41	47	45	48
TOTAL INVENTORY	96	112	133	140	145	142	132	2,279	2,673	3,166	3,328	3,445	3,389	3,145

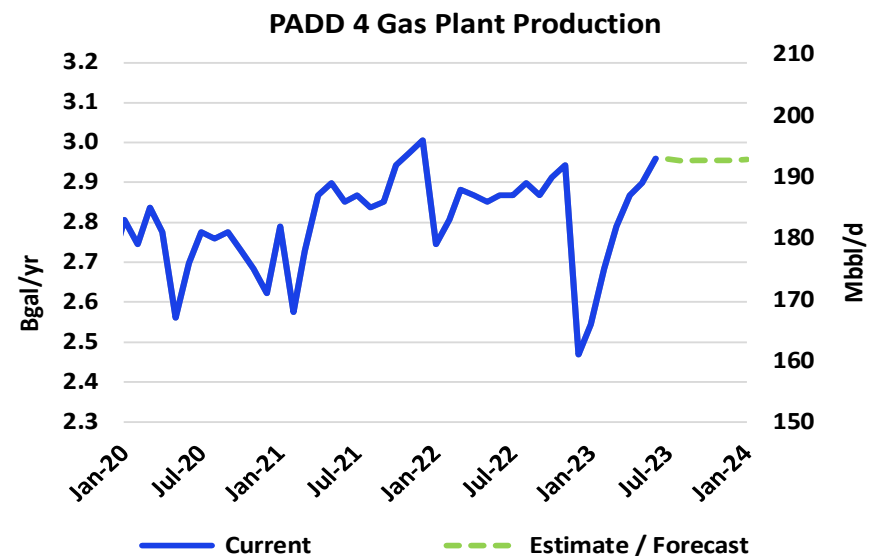
INSIGHTS & ANALYSIS

PADD 4 (Rocky Mountain) inventories built by 162 Mbbl in August to 3.3 MMbbl (140 MMgal), which is 602 Mbbl higher than last year and 1.2 MMbbl above the 5-year average. Gas plant production was unchanged in August at 193 Mb/d (see Figure 7.4). Refinery production and imports were flat at 7 Mb/d and 9 Mb/d, respectively.

PADD 4 OUTLOOK

PADD 4 inventories are projected to build by 117 Mbbl during the last month of the storage injection season (April-September), bringing September stocks to 3.4 MMbbl (142 MMgal), which is 533 Mbbl higher than last year and 1 MMbbl above the 5-year average. PADD 4 gas plant production is expected to remain flat in August at 193 Mb/d and average 187 Mb/d for the year, up 2 Mb/d from 2022.

Figure 7.4

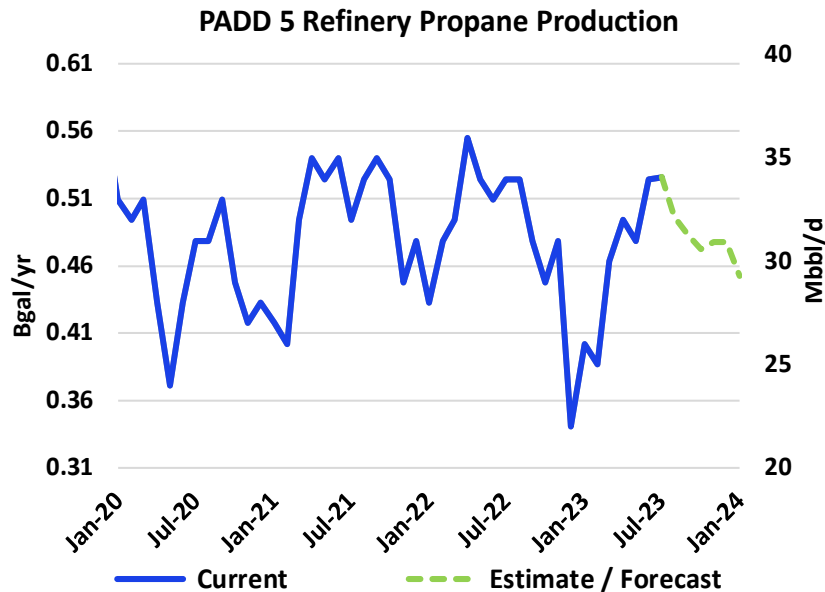


Source: EIA, RBN Forecast

PADD 5: PROPANE SUPPLY & DEMAND

Table J:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Production	51	53	53	53	49	50	49	39	42	41	41	39	39	39
Gas Plants	10	10	9	11	10	10	10	8	8	7	9	8	8	8
Refinery	40	43	44	42	39	40	39	31	34	34	32	31	31	31
Imports	35	29	31	31	32	35	37	27	23	24	24	25	27	29
Net Inter-PADD Transfers	27	13	14	16	17	18	17	21	10	11	12	14	14	14
TOTAL SUPPLY	113	95	98	100	98	102	103	87	75	75	77	78	79	82
Demand (Prod. Supplied)	57	26	47	52	62	55	75	44	21	36	40	49	42	60
Exports	30	50	39	39	32	35	37	23	40	30	30	25	27	30
Stock Change	25	18	12	9	5	13	(9)	19	14	9	7	4	10	(7)
TOTAL DISPOSITION	112	95	98	100	98	102	103	86	75	75	77	78	79	82
TOTAL INVENTORY	53	70	82	92	97	110	100	1,270	1,675	1,961	2,180	2,298	2,614	2,391

Figure 7.5



Source: EIA, RBN Forecast

INSIGHTS & ANALYSIS

PADD 5 (West Coast) inventories grew by 219 Mbbl in August to 2.2 MMbbl (92 MMgal), leaving stocks 528 Mbbl higher than last year (5-year minimum) and only 32 Mbbl above the 5-year average. Refinery production was down 2 Mb/d to 32 Mb/d as capacity utilization fell by 2 percentage points to 90%. West Coast exports were unchanged from the prior month at 30 Mb/d and above imports, which remained at 24 Mb/d.

PADD 5 OUTLOOK

Our propane model projects West Coast inventories to increase by 100 Mbbl in September to 2.3 MMbbl (96 MMgal), leaving stocks 71 Mbbl below the 5-year average. As shown in Figure 7.5, refinery production in PADD 5 is expected to be modestly lower at 31 Mb/d in September as capacity utilization falls to 88%. 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 September are estimated at 25 Mb/d, down 5 Mb/d from the prior month. PADD 5 exports are forecast to average 31 Mb/d for the year, up 4 Mb/d from 2022.

KEY ENERGY PRICES

Table K:		Prices									
Product	Units	Current 1-Sep-23	Prior Week 25-Aug-23		Prior Month 1-Aug-23		Prior Year 1-Sep-22				
			W/W	W/W %	M/M	M/M %	Y/Y	Y/Y %			
Brent Crude	\$/bbl	88.6	84.5	4.1	4.8%	84.9	3.6	4.3%	92.4	(3.8)	-4.1%
WTI Cushing Crude	\$/bbl	85.6	79.8	5.7	7.2%	81.4	4.2	5.1%	86.6	(1.1)	-1.2%
Henry Hub Natural Gas	\$/MMBtu	2.77	2.54	0.23	8.9%	2.56	0.21	8.0%	9.26	(6.50)	-70.1%
Propane											
Mont Belvieu Non-TET	c/gal	72.2	67.1	5.1	7.6%	68.3	3.9	5.8%	110.0	(37.8)	-34.4%
Mont Belvieu TET	c/gal	72.2	68.1	4.1	6.0%	71.7	0.5	0.7%	108.2	(36.0)	-33.3%
Conway	c/gal	70.9	64.5	6.4	9.9%	69.2	1.7	2.4%	107.8	(36.8)	-34.2%
Edmonton*	c/gal	52.7	47.4	5.3	11.2%	56.5	(3.8)	-6.7%	93.5	(40.9)	-43.7%
European (ARA)	\$/MT	571.0	518.0	53.0	10.2%	513.7	57.3	11.2%	637.1	(66.1)	-10.4%
Asian (FEI)	\$/MT	688.0	626.0	62.0	9.9%	613.3	74.7	12.2%	681.2	6.8	1.0%

Figure 8.1

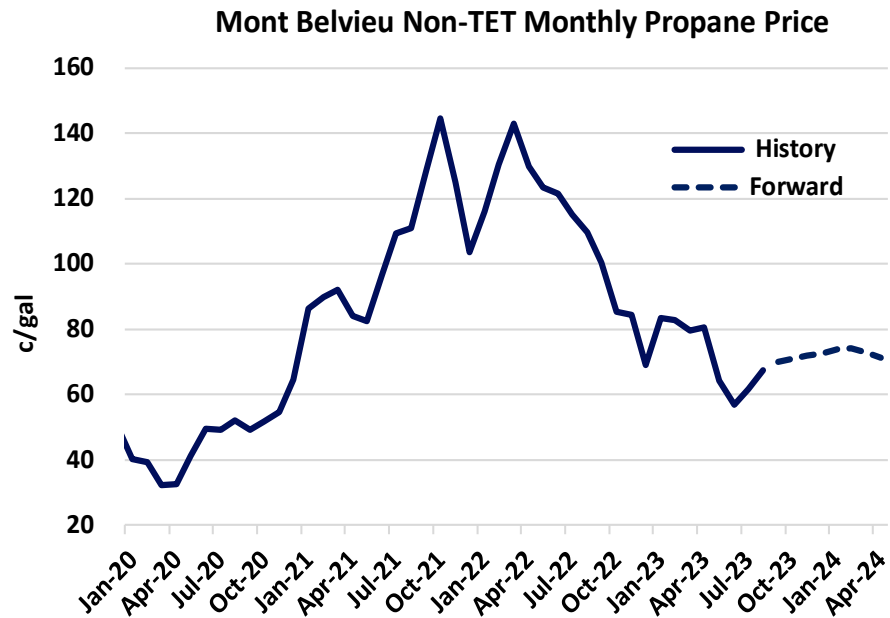
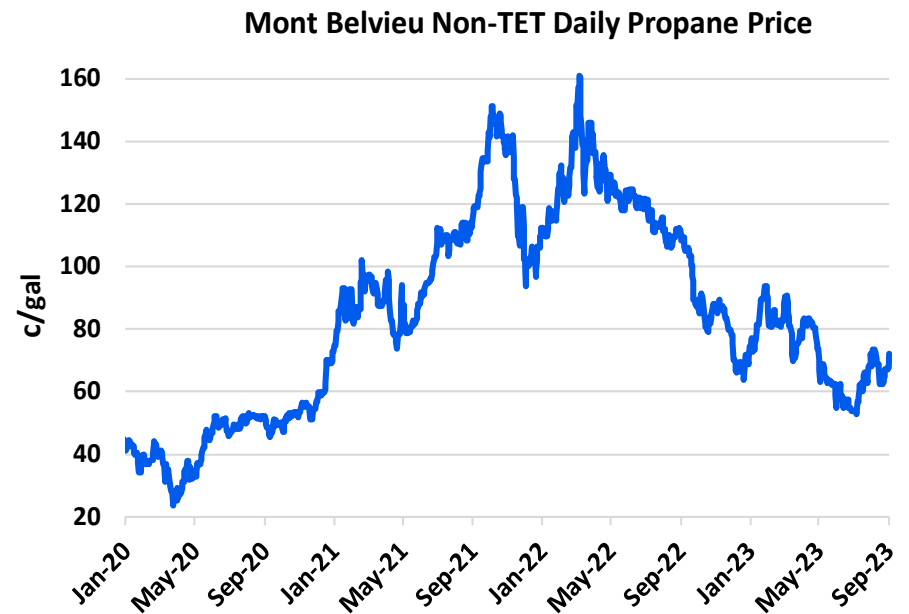


Figure 8.2



MONTHLY PROPANE PRICE TRENDS

Figure 8.3

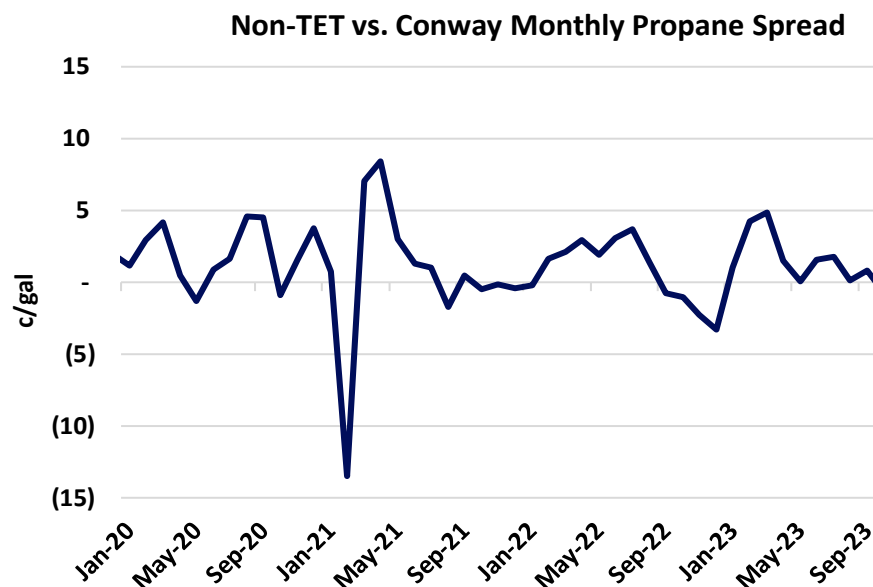


Figure 8.4

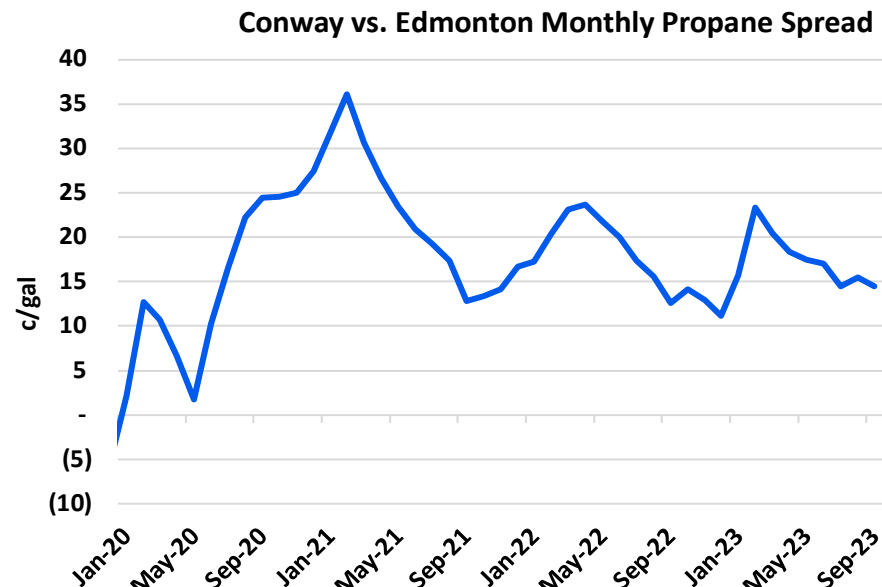


Figure 8.5

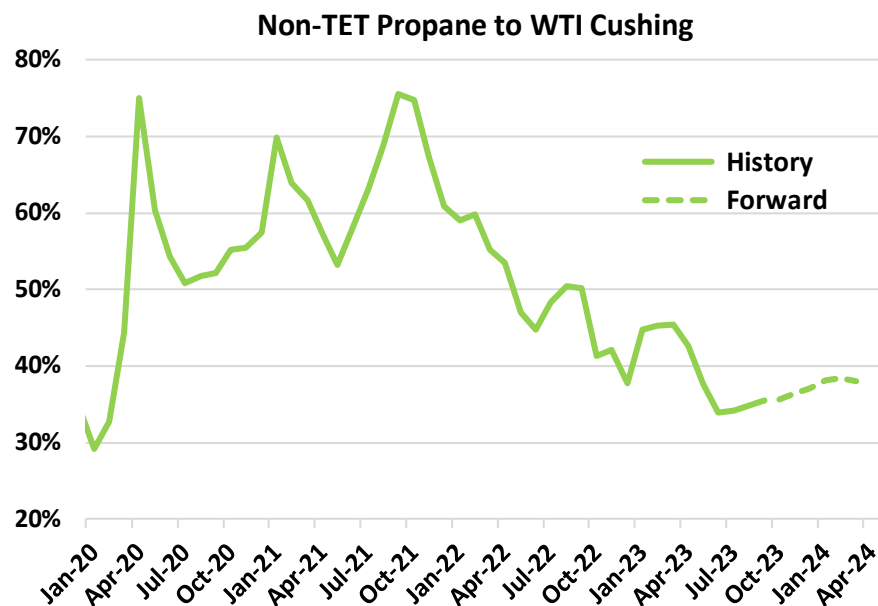


Table L: MB TET Propane / WTI Cushing					
%	2020	2021	2022	2023	Y/Y %
Jun	54.8%	56.9%	44.8%	34.3%	-23.5%
Jul	50.0%	63.3%	48.4%	35.0%	-27.8%
Aug	50.2%	69.1%	50.2%	35.2%	-29.7%
Q1	36.6%	65.8%	58.3%	45.0%	-22.9%
Q2	60.5%	55.5%	48.8%	38.4%	-21.3%
Q3	50.6%	69.2%	49.5%	35.2%	-28.9%
Q4	56.0%	67.7%	40.8%		
Year	51.0%	64.6%	49.3%	40.0%	-18.9%

INTERNATIONAL PROPANE PRICE SPREADS

Figure 9.1

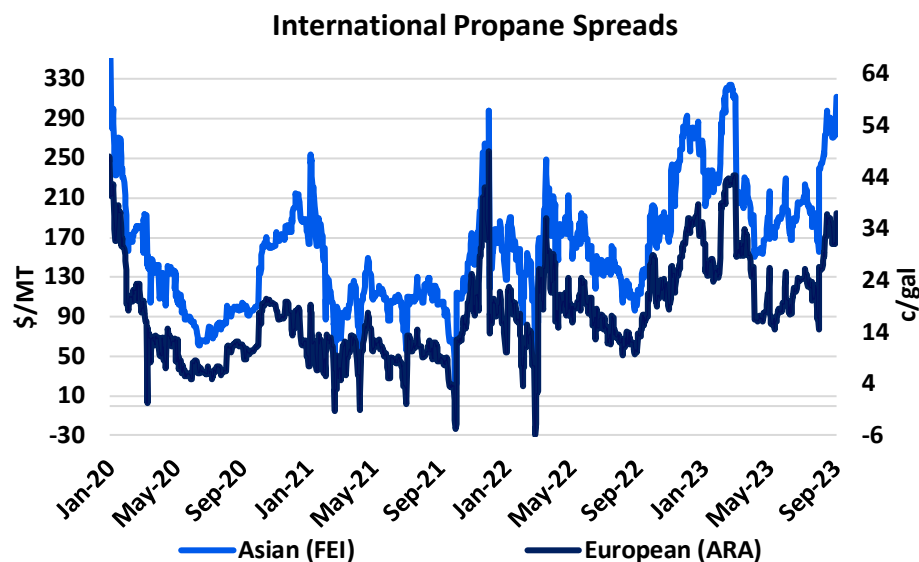


Figure 9.2

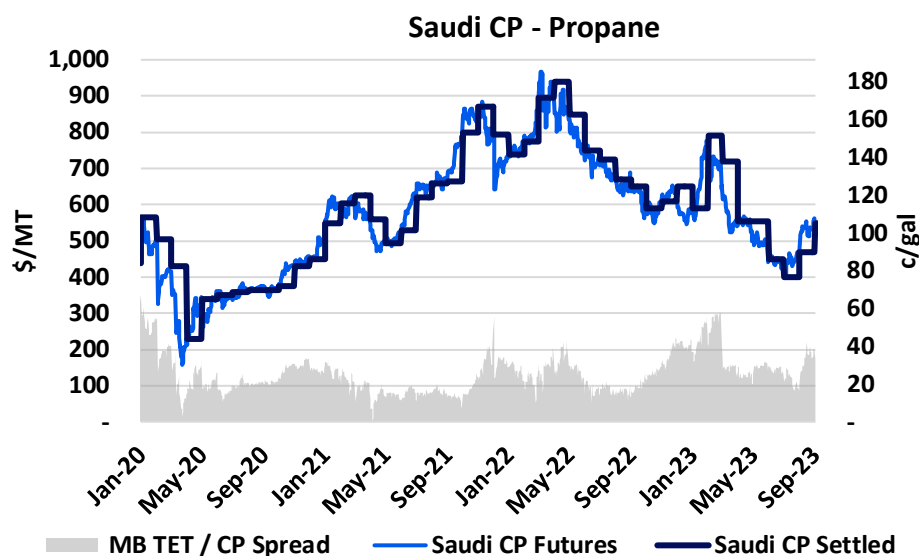


Table M: Asian FEI / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Jun	70.1	97.5	143.2	191.0	33.3%
Jul	78.9	109.7	140.4	194.4	38.5%
Aug	96.8	115.6	111.2	269.9	142.7%
Q1	192.9	129.5	151.5	247.9	63.6%
Q2	97.6	106.1	163.8	181.5	10.8%
Q3	91.0	101.1	134.0	269.9	101.4%
Q4	175.0	163.6	232.5		
Year	139.1	125.1	170.6	219.4	28.6%

Table N: European ARA / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Jun	37.6	38.4	89.2	112.9	26.6%
Jul	34.9	60.9	73.3	116.6	59.1%
Aug	59.2	54.5	61.8	165.2	167.2%
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	165.2	108.4%
Q4	89.5	111.3	147.9		
Year	76.4	66.0	104.1	137.6	32.2%

Table O: Saudi CP / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Jun	81.3	84.1	91.1	145.0	59.1%
Jul	106.0	79.2	91.6	114.4	25.0%
Aug	106.3	85.6	83.2	175.2	110.7%
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	175.2	91.3%
Q4	150.0	144.3	178.4		
Year	137.6	103.7	135.4	170.8	26.1%

U.S. PROPANE SUPPLY & DEMAND BALANCE DETAIL

Table P:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Gas Processing	2,577	2,588	2,682	2,691	2,610	2,701	2,619	1,979	2,054	2,060	2,067	2,071	2,075	2,078
Refinery Propane	375	358	373	381	360	368	356	288	284	287	293	286	283	283
Imports	86	89	88	96	82	109	125	66	71	68	74	65	84	100
TOTAL SUPPLY	3,038	3,035	3,144	3,168	3,052	3,178	3,100	2,333	2,409	2,414	2,433	2,422	2,441	2,460
Product Supplied	678	803	821	784	998	1,090	1,218	521	637	630	602	792	837	967
ResCom	397	329	332	333	328	476	610	305	261	255	256	260	366	484
Crop Drying	39	39	39	80	128	215	177	30	31	30	62	102	165	140
Industrial	84	82	94	94	89	96	99	64	65	72	73	71	73	78
Petrochemicals	215	199	228	228	215	229	228	165	158	175	175	171	176	181
PDH	85	82	104	111	113	117	120	65	65	80	85	90	90	95
Balancing	(141)	73	23	(62)	124	(43)	(15)	(108)	58	18	(47)	98	(33)	(12)
Exports	1,927	1,891	2,010	2,061	1,971	2,058	1,982	1,480	1,501	1,544	1,583	1,565	1,581	1,573
Stock Change	432	340	313	323	83	30	(101)	332	270	240	248	66	23	(80)
TOTAL DISPOSITION	3,038	3,034	3,143	3,168	3,052	3,178	3,100	2,333	2,408	2,414	2,434	2,422	2,441	2,460
TOTAL INVENTORY	2,984	3,324	3,637	3,960	4,043	4,073	3,973	71,047	79,145	86,592	94,288	96,259	96,984	94,589
Last Year Inventory	2,086	2,273	2,695	3,059	3,443	3,642	3,682	49,671	54,127	64,161	72,838	81,980	86,724	87,672
Stock M/M Δ	432	340	313	323	83	30	(101)	10,292	8,100	7,447	7,697	1,970	725	(2,395)
Last Year Stock M/M Δ	397	188	419	361	386	201	40	9,455	4,470	9,982	8,587	9,180	4,774	960

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

PADD AVERAGE HEATING DEGREE DAYS (HDDs)

Figure 10.1

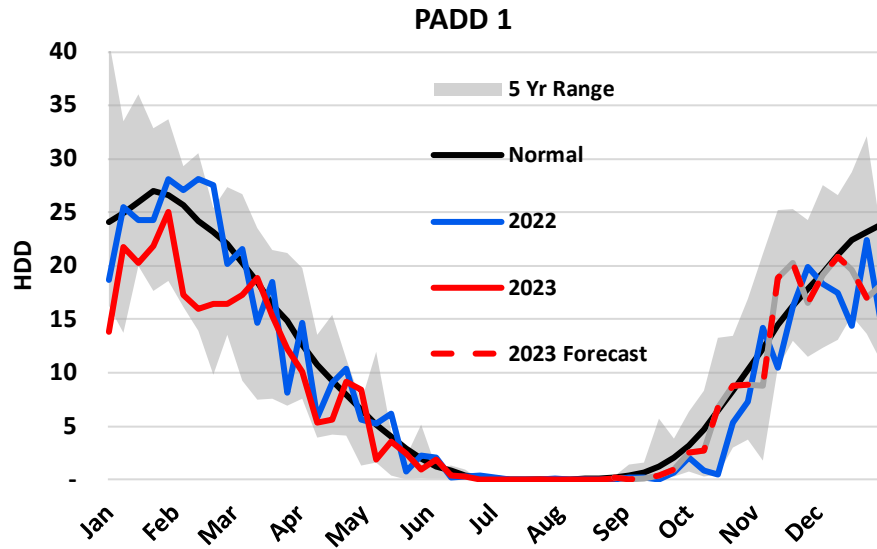


Figure 10.2

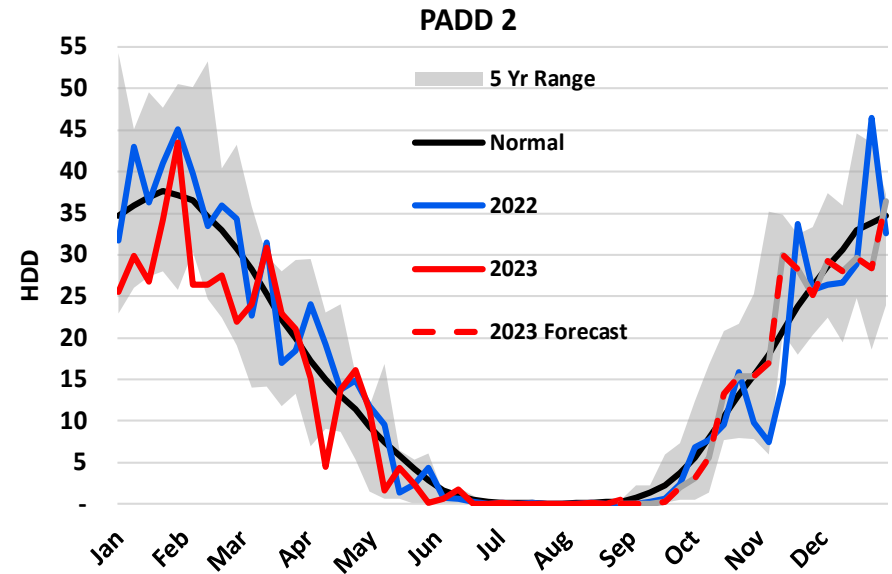


Figure 10.3

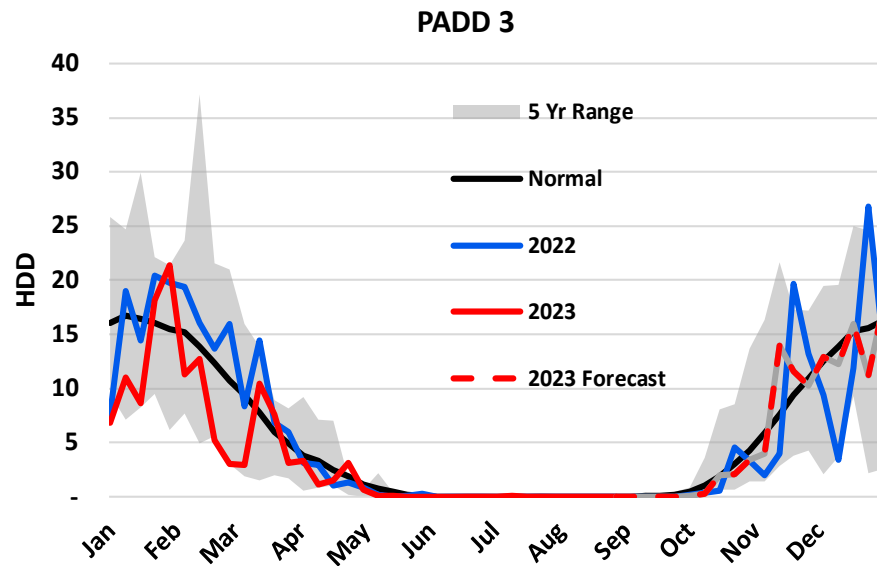


Figure 10.4

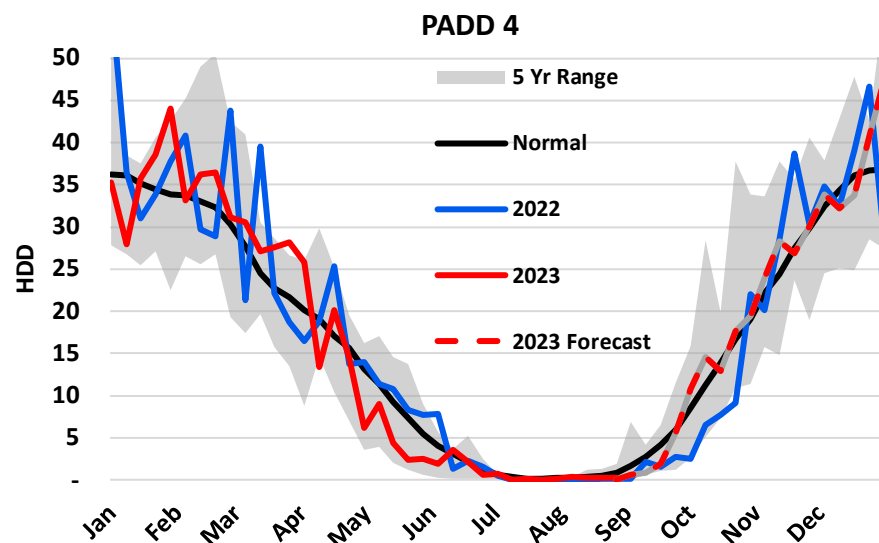
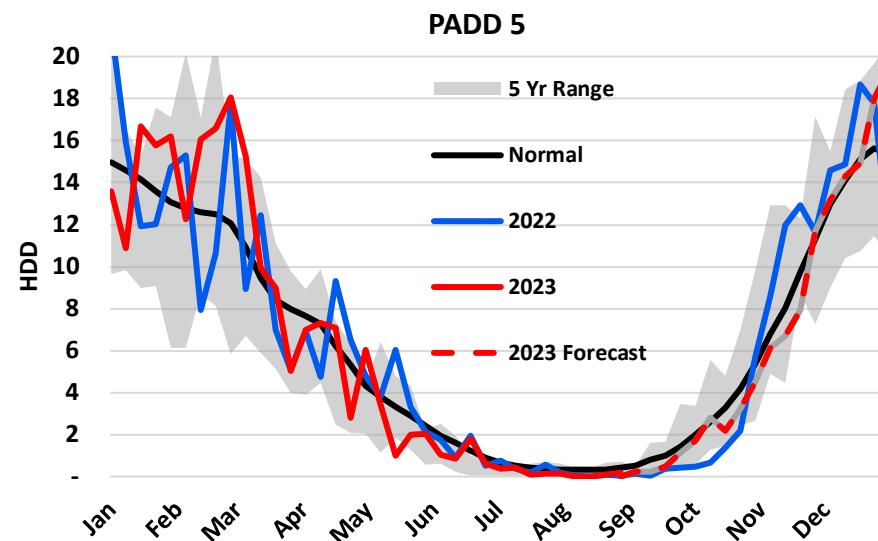


Figure 10.5



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