



RBN U.S. Propane Billboard

U.S. Propane Market Update & Outlook

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April 12, 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		
	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Production	2,672	2,776	2,562	2,881	2,820	2,938	2,867	2,052	2,132	2,179	2,213	2,238	2,257	2,275
Gas Plants	2,332	2,431	2,251	2,522	2,459	2,562	2,501	1,791	1,867	1,914	1,937	1,951	1,968	1,985
Refinery	340	345	311	359	361	376	365	261	265	264	276	286	289	290
Imports	178	214	176	164	84	53	55	137	164	149	126	67	41	44
TOTAL SUPPLY	2,850	2,989	2,737	3,045	2,903	2,991	2,922	2,189	2,296	2,328	2,339	2,304	2,298	2,319
Demand (Prod. Supplied)	1,389	1,427	1,329	1,047	843	821	684	1,067	1,096	1,130	804	669	631	543
Exports	1,926	1,897	1,790	2,192	2,016	2,002	1,953	1,479	1,457	1,522	1,683	1,600	1,537	1,550
Stock Change	(465)	(335)	(381)	(194)	45	169	285	(357)	(257)	(324)	(149)	35	130	226
TOTAL DISPOSITION	2,850	2,989	2,738	3,045	2,903	2,991	2,922	2,189	2,296	2,328	2,339	2,304	2,298	2,319
TOTAL INVENTORY*	3.2	2.9	2.5	2.3	2.4	2.5	2.8	76.6	68.6	59.5	54.9	56.0	60.0	66.8

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

MONTHLY HIGHLIGHTS

- Propane prices were weaker during the month, sinking by 12%, falling much more than crude. The benchmark propane-to-WTI Cushing ratio declined to 43% as of April 6, down 4 percentage points from March 1 and close to the 5-year low for the period (see Figure 1.2).
- U.S. propane exports soared in March to a record-high rate of 1,683 Mb/d, up 161 Mb/d from February and 218 Mb/d above March 2022. First-quarter 2023 exports averaged 1,554 Mb/d, up a whopping 202 Mb/d, or 15%, from Q1 2022. Total propane exports are almost 18 MMbbl higher this year compared to the same period in 2022.
- Propane production growth finally showed some signs of life, increasing for the first time since September. January gas plant production, as reported by the EIA on March 31, increased to 1,867 Mb/d, up 76 Mb/d from December's weather-impacted rate. While January production remains 94 Mb/d below September's all-time high, we expect volumes to fully recover by May and to post solid gains in the second half of the year.
- Despite record exports and lackluster production, total U.S. propane inventories are still in good shape as we exit winter and enter the storage injection season. March ending inventories are about 19 MMbbl higher than last year and 24% above the 5-year average.
- Enterprise Products announced on March 31 that it plans to expand its Houston Ship Channel LPG export terminal. The project will increase Enterprise's propane/butane export capacity by 120 Mb/d, or about 16%, to 883 Mb/d and is expected to be completed by mid-2025.

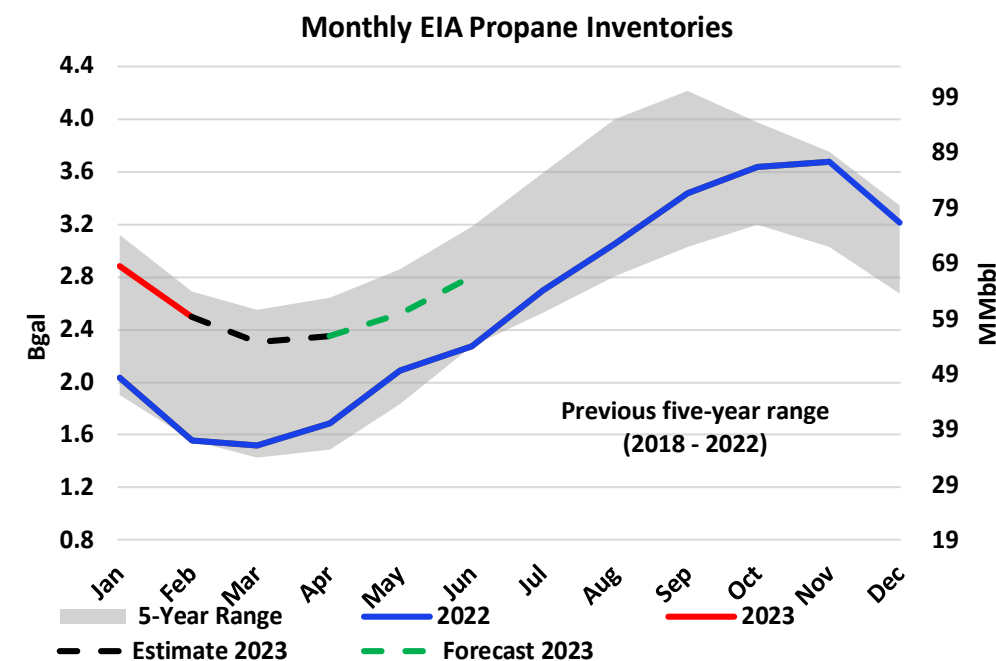
MARKET OVERVIEW

Continuing the trend from February, strong overseas export demand continued to be the dominant market theme in March. From a supply perspective, the U.S. propane market remains in good shape with inventories well above last year and the 5-year average in most regions as we head into the storage injection season.

U.S. PROPANE INVENTORIES

Table B: MM gal							M bbl					
	MONTHLY EIA			ESTIMATED		FORECAST	MONTHLY EIA			ESTIMATED		FORECAST
	Dec-22	Jan-23	M/M	Feb-23	Mar-23		Dec-22	Jan-23	M/M	Feb-23	Mar-23	
PADD 1 (East Coast)	287	267	(20)	227	195	212	6,839	6,354	(485)	5,395	4,639	5,057
PADD 2 (Midwest)	967	838	(129)	613	486	510	23,026	19,960	(3,066)	14,607	11,580	12,153
PADD 3 (Gulf Coast)	1,798	1,642	(156)	1,551	1,537	1,533	42,812	39,104	(3,708)	36,927	36,588	36,494
PADD 4 (Rocky Mountains)	101	86	(15)	68	54	61	2,397	2,041	(356)	1,618	1,296	1,453
PADD 5 (West Coast)	62	48	(14)	42	35	35	1,480	1,153	(327)	999	834	839
TOTAL PROPANE	3,215	2,882	(334)	2,501	2,307	2,352	76,554	68,612	(7,942)	59,546	54,936	55,996
Propylene	56	40	(16)	35	32	30	1,338	963	(375)	834	772	705
TOTAL INVENTORIES	3,271	2,922	(349)	2,536	2,340	2,381	77,892	69,575	(8,317)	60,380	55,708	56,701

Figure 1.1



Source: EIA

ANALYSIS & INSIGHTS

U.S. propane inventories declined at an above-average rate during the month, falling by 4.6 MMbbl, bringing ending stocks for March to 54.9 MMbbl (2.3 Bgal), which is 18.7 MMbbl, or 52%, above last year and 18% higher than the 5-year average. PADD 3 stocks fell by 340 Mbbl month-on-month, leaving inventories 7.9 MMbbl above the 5-year average. PADD 2 inventories declined by 3.0 MMbbl, which was well above the 883 Mbbl average draw for the month. Midwest stocks are 2.6 MMbbl above last year and 1.8 MMbbl above the 5-year average. PADD 1 inventories dropped by 756 Mbbl, which was more than the 220-Mbbl build last year and above the 5-year average draw of 378 Mbbl. PADD 4 stocks fell by 322 Mbbl to 1.3 MMbbl, which is 589 Mbbl below last year and 344 Mbbl below the 5-year average. PADD 5 inventories declined by 165 Mbbl to 834 Mbbl, which is 298 Mbbl more than last year and 251 Mbbl above the 5-year average.

INVENTORY OUTLOOK

Total U.S. propane inventories are projected to start the storage injection season with a smaller-than-average build of 1.1 MMbbl, bringing April stocks to 56 MMbbl (2.4 Bgal), which is 15.8 MMbbl more than last year and 8.7 MMbbl above the 5-year average.

PROPANE MARKET UPDATE

PROPANE MARKET WEAKER IN MARCH

WTI prices drifted lower in March, trading below \$80/bbl for most of the month. Crude oil prices have been under pressure due to economic concerns and fears of rising U.S. interest rates. West Texas Intermediate (WTI) closed at \$75.67/bbl on March 31, down \$3.01/bbl, or 2.6%, from March 1. However, crude prices rebounded back above \$80/bbl in early April following the OPEC+ surprise announcement to cut output by 1.6 million b/d starting in May.

U.S. propane prices were weaker than crude, falling by 12.4% during the month. OPIS non-LST (Enterprise, aka non-TET) propane averaged 79.2 c/gal in March, settling at 77.2 c/gal on March 31, down 10.9 c/gal from the beginning of the month. OPIS LST (Energy Transfer, aka TET) propane prices averaged 79.5 c/gal during the month, closing at 77.5 c/gal on March 31, falling 9.8 c/gal from March 1. The non-TET vs. TET price spread was unchanged during the month with a 0.3 c/gal non-TET discount on March 31. Conway OPIS propane averaged 74.4 c/gal during the month, which represented a 4.8 c/gal discount to the average non-LST price.

The benchmark propane-to-WTI Cushing ratio settled at 43% as of April 6, down 4 percentage points from March 1. The current forward curves project the propane-to-WTI ratio to average around 44% through July, which is 2 percentage points lower than implied by the forward curves from last month.

Figure 1.2

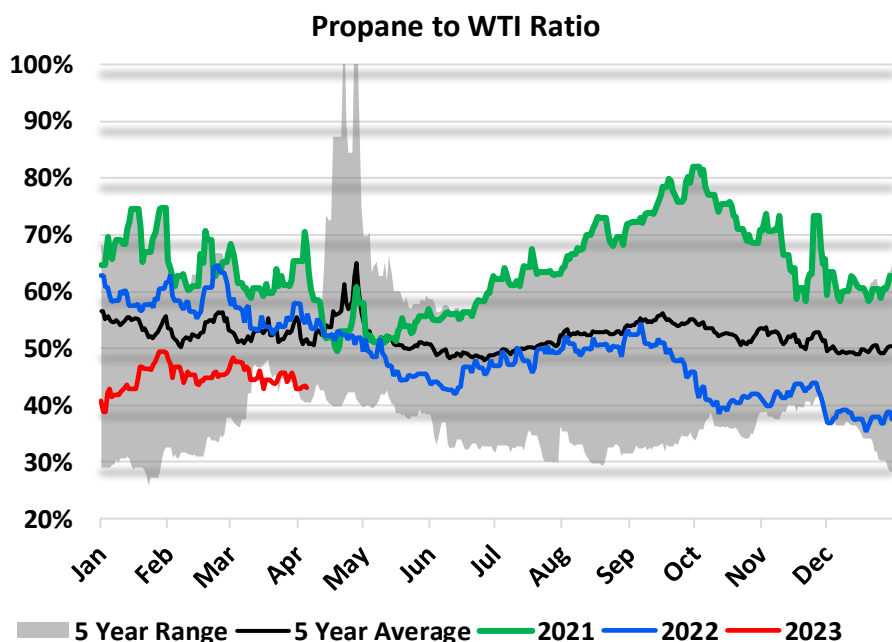
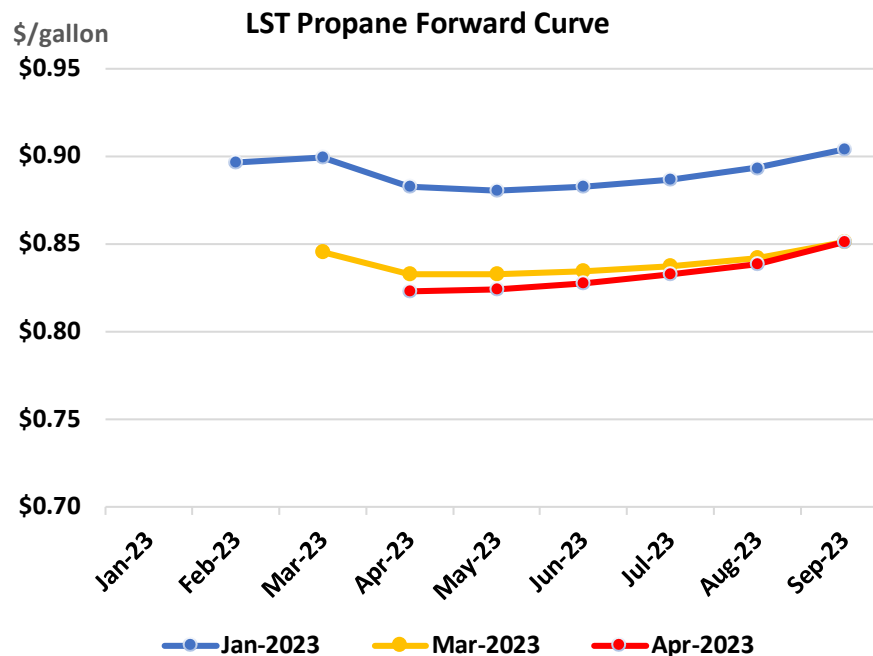


Figure 1.3



CONWAY VS. MONT BELVIEU PROPANE PRICES

Figure 2.5

CONWAY DISCOUNT TO BELVIEU NARROWS

Conway spot propane (OPIS) moved to a 4.8 c/gal average discount to Mont Belvieu during March, compared to a 4.3 c/gal discount in February and a 1.0 c/gal discount in January. In March 2022, Conway was at an average discount of 2.1 c/gal while in 2018 it was at a discount of 13.9 c/gal. The 5-year average Conway discount for March is 6.7 c/gal. As of April 6, Conway spot propane (OPIS) was at a 1.8 c/gal discount to Mont Belvieu.

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 Mont Belvieu to trade at a 2 c/gal premium to Conway in May, then gradually narrow through the summer months before flipping to a small discount in November.

For 2023, the forward curves project that Gulf Coast propane prices will trade higher than Conway for most of the year, with Mont Belvieu averaging 1.4 c/gal over Conway compared to a 0.8 c/gal premium last year.

MB Non-TET vs. Conway Propane Spread

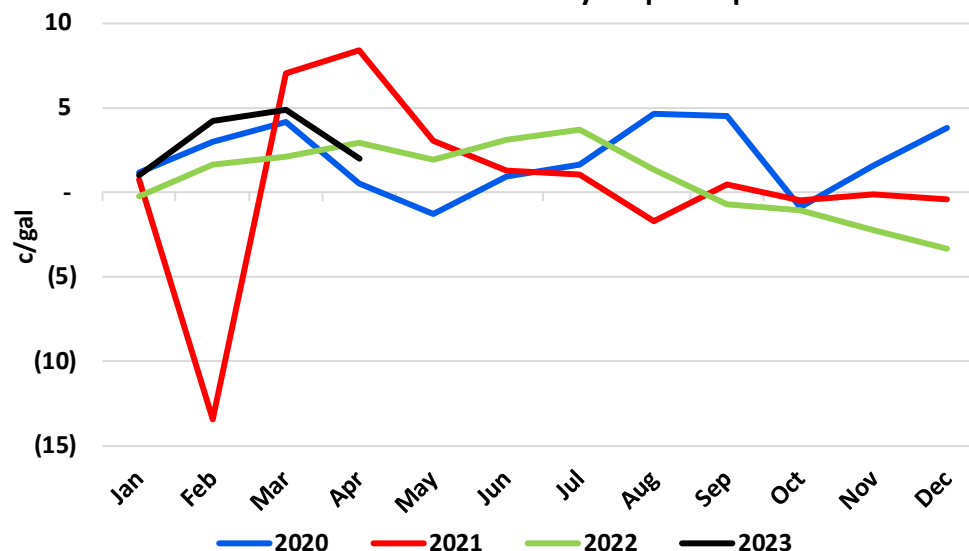
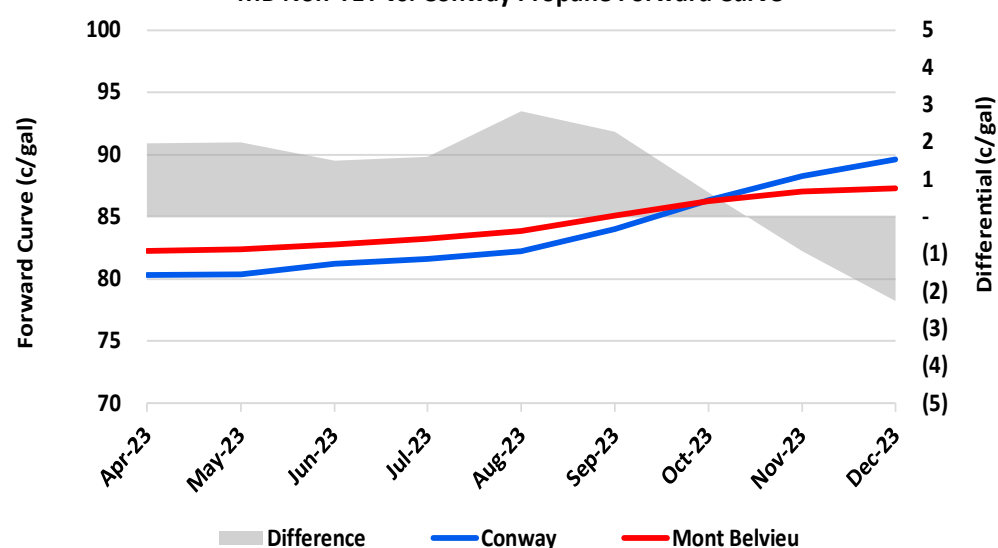


Figure 2.6

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
	Dec-22	Jan-23	M/M	Feb-23	Mar-23		Dec-22	Jan-23	M/M	Feb-23	Mar-23	
ResCom	858	812	(47)	755	772	529	659	623	(36)	642	593	420
Crop Drying	136	77	(59)	57	40	40	105	59	(45)	48	30	31
Industrial	113	120	7	108	105	87	87	92	6	92	80	69
Petrochemicals	187	233	46	204	222	209	143	179	35	174	171	166
PDH	72	72	-	93	103	101	55	55	-	79	79	80
Balancing	24	114	90	111	(195)	(374)	18	87	69	94	(149)	(297)
TOTAL PROPANE	1,389	1,427	38	1,329	1,047	591	1,067	1,096	29	1,130	804	469
Propylene	309	340	31	297	338	374	237	261	24	253	260	297
TOTAL DEMAND **	1,698	1,767	69	1,626	1,385	965	1,304	1,357	53	1,383	1,064	766
Weekly***	1,816	1,716	(100)	1,630	1,399		1,395	1,318	(77)	1,386	1,075	
Variance	118	(50)	(169)	4	14		91	(39)	(130)	3	11	

* 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 January, weekly through the week of March 31, 2023.

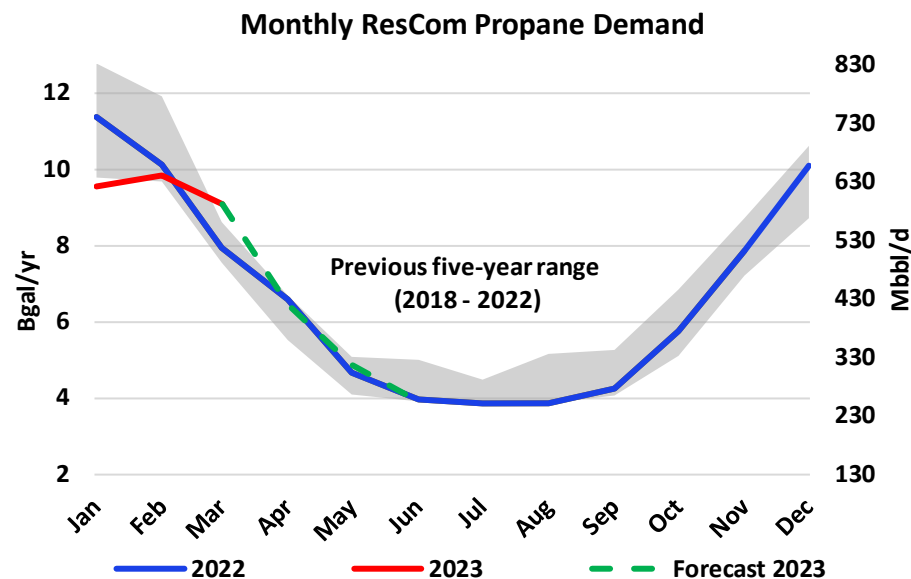
RESIDENTIAL & COMMERCIAL

Figure 3.1 shows our current forecast for Residential & Commercial (“ResCom”) demand through June. ResCom demand was lower in March at 593 Mb/d (772 MMgal/m), 49 Mb/d below February but 76 Mb/d above March 2022. March weather across most of the U.S. was colder than normal with 13% more HDDs than last year and 10% higher than the 5-year average. ResCom demand for April is projected at 420 Mb/d, down 173 Mb/d from March and 10 Mb/d below April 2022. For more details on propane heating demand for the recent winter season, see the Appendix (Page 19).

PETROCHEMICAL AND PDH DEMAND LACKLUSTER

U.S. steam cracker demand for propane was relatively unchanged in March at 171 Mb/d, reduced by about 20 Mb/d due to spring maintenance turnarounds. We expect propane cracking rates to gradually increase through mid-2023 given the improved margins for propane cracking. U.S. PDH plant demand was also unchanged in March with all three U.S. PDH plants back online and higher propylene prices. PDH plant demand is expected to ramp-up in midyear with the startup of Enterprise’s new PDH 2 plant (30 Mb/d propane demand).

Figure 3.1



U.S. PROPANE EXPORTS

Table D: U.S. Propane Exports Monthly and Weekly*						
(Mbbbl/d)	MONTHLY EIA			ESTIMATED		FORECAST
	Dec-22	Jan-23	M/M	Feb-23	Mar-23	Apr-23
Gulf Coast	1,347	1,324	(23)	1,377	1,451	1,390
East Coast	93	105	12	113	190	175
West Coast	36	24	(12)	28	37	30
Other	3	4	1	4	5	5
TOTAL EXPORTS	1,479	1,457	(22)	1,522	1,683	1,600
Weekly	1,438	1,496	58	1,609	1,611	
Variance	(41)	39	80	87	(73)	

*Monthly data from EIA through January, weekly through the week of March 31, 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 190 Mb/d in March, up 77 Mb/d from February. PADD 1 exports are expected to remain robust in April at 175 Mb/d, down 15 Mb/d from March. East Coast exports (green bars in Figure 4.1) are forecast to grow at a healthy rate in 2023,

averaging 149 Mb/d, up 15 Mb/d from 2022. One propane cargo of 270 Mbbbl was imported into the Newington, NH, terminal in early March, the fourth shipment received since November 2022.

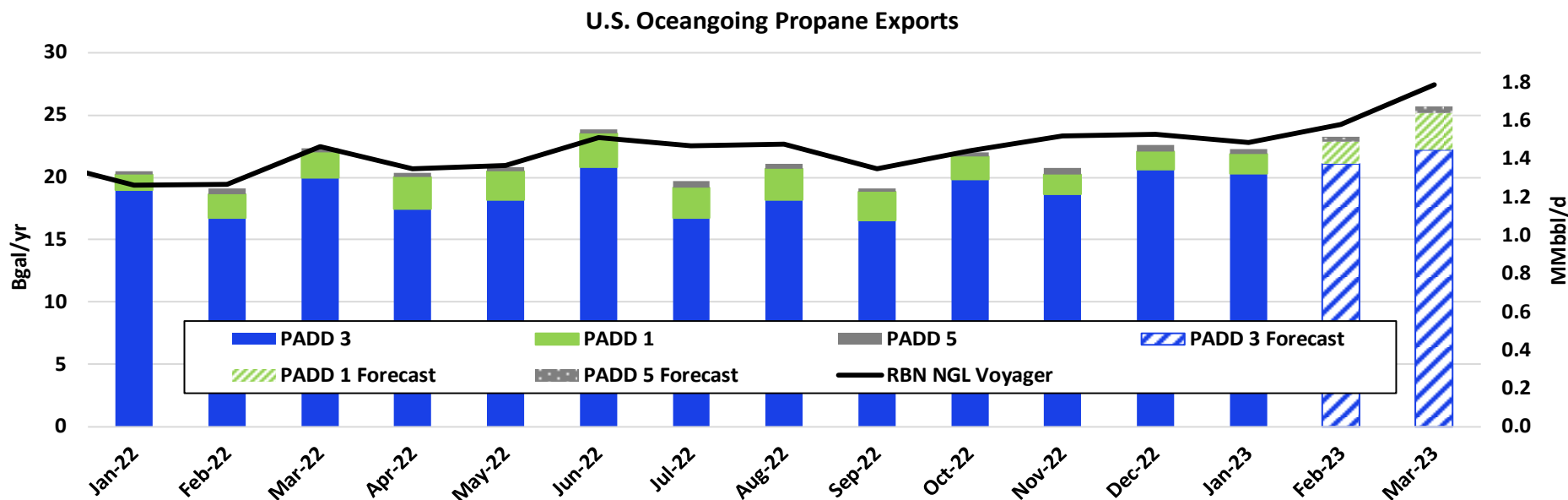
GULF COAST EXPORTS

Propane exports out of the Gulf Coast were at a record-high rate in March at 1,451 Mb/d, up 74 Mb/d from February and 149 Mb/d more than March 2022. For April, we expect PADD 3 exports to remain strong at 1,390 Mb/d. Gulf Coast exports (blue bars in Figure 4.1) are forecast to grow at a healthy clip in 2023, averaging 1,356 Mb/d, up 145 Mb/d, or 12%, from 2022.

WEST COAST EXPORTS

On the U.S. West Coast, propane exports were up 9 Mb/d from the prior month to 37 Mb/d. PADD 5 exports are expected to fall to 30 Mb/d in April and average 27 Mb/d for 2023, unchanged 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

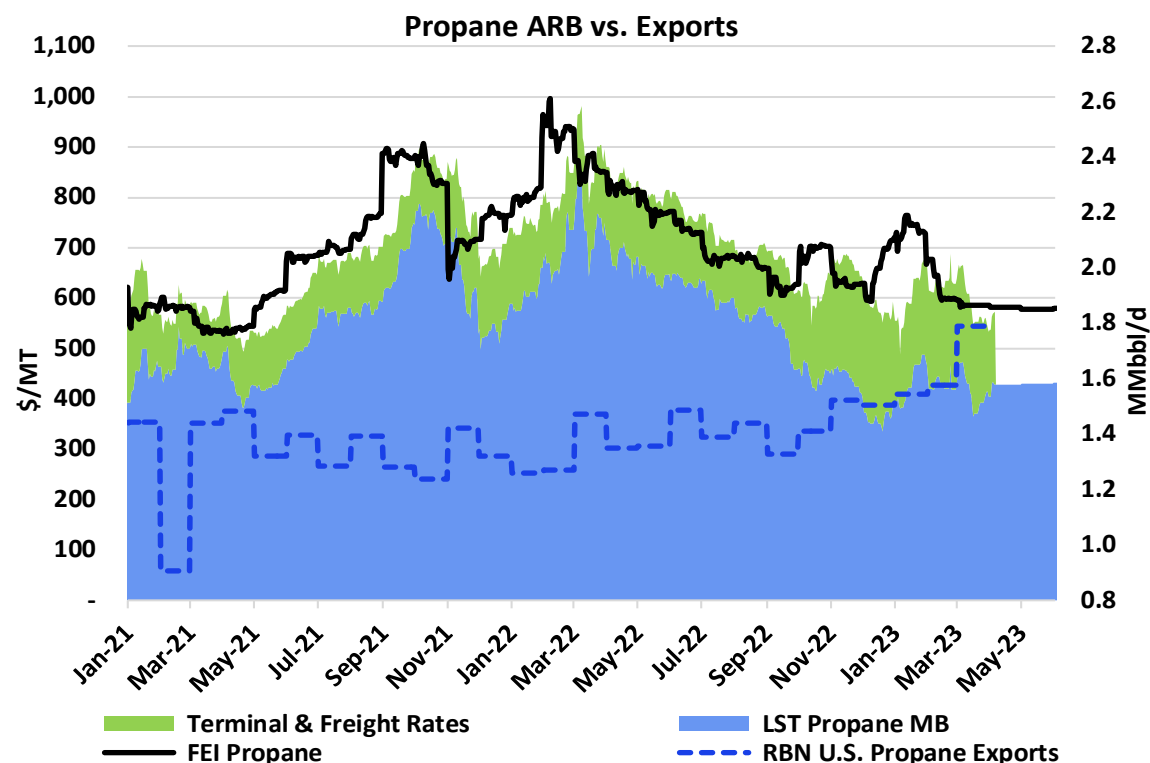
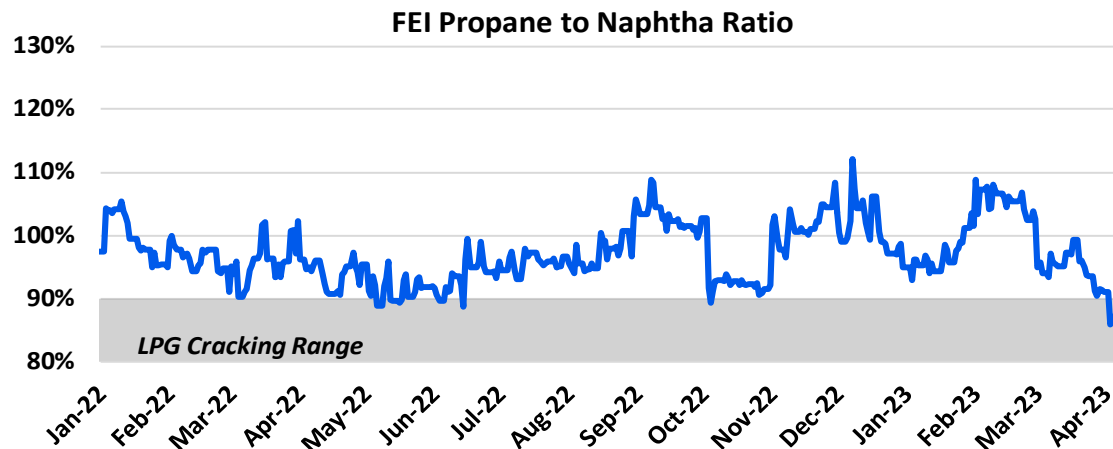


Figure 4.3



U.S.-ASIA EXPORT ARB MARGINALLY OPEN

Saudi Aramco slashed its LPG contract prices (CP) for April amid ample supplies from the U.S. and Middle East. The April CP for propane was cut by \$165/MT to \$555/MT while normal butane was lowered by \$195/MT to \$545/MT.

VLGC freight rates plunged in March amid shorter wait times at the Panama Canal and narrower arbitrage spreads. Spot VLGC freight rates from the U.S. Gulf Coast to Chiba, Japan, (via Panama Canal) sank by \$43.5/MT to \$113.5/MT as of April 6, which is 27.7% lower than the rate on March 1. Rates were driven down by reduced wait times at the Panama Canal, which were at three days northbound and seven days southbound as of April 6. Terminal fees were also lower during the month, falling by 2 c/gal to 6 c/gal as of April.

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). The LST propane price declined by \$26/MT during the month to close at \$429/MT, or 82.3 c/gal, on April 6, while the May FEI propane forward curve fell by \$42/MT, which resulted in a narrower spread between U.S. and Asian prices. The arb for April-May was \$152/MT, or 29.2 c/gal, on April 6. Taking into consideration terminal fees and freight costs, the arb for April-May was open (negative, thus economic) at -\$8/MT, or -1.5 c/gal.

Figure 4.3 shows the ratio of the Asian FEI propane price to naphtha in the same region. On April 6, the ratio plunged to 86%, its lowest level since July 2020, which indicates that Asia crackers will favor propane feed over naphtha.

U.S. PROPANE PRODUCTION

Figure 5.1

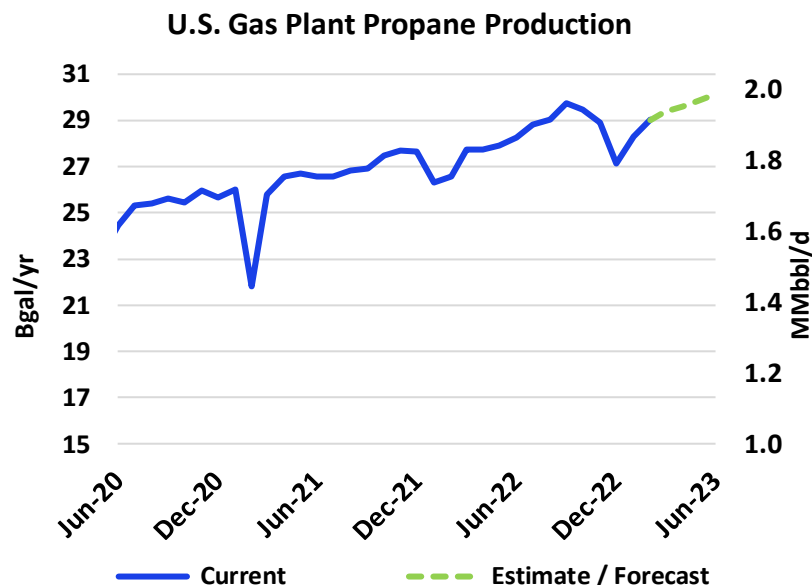


Figure 5.2

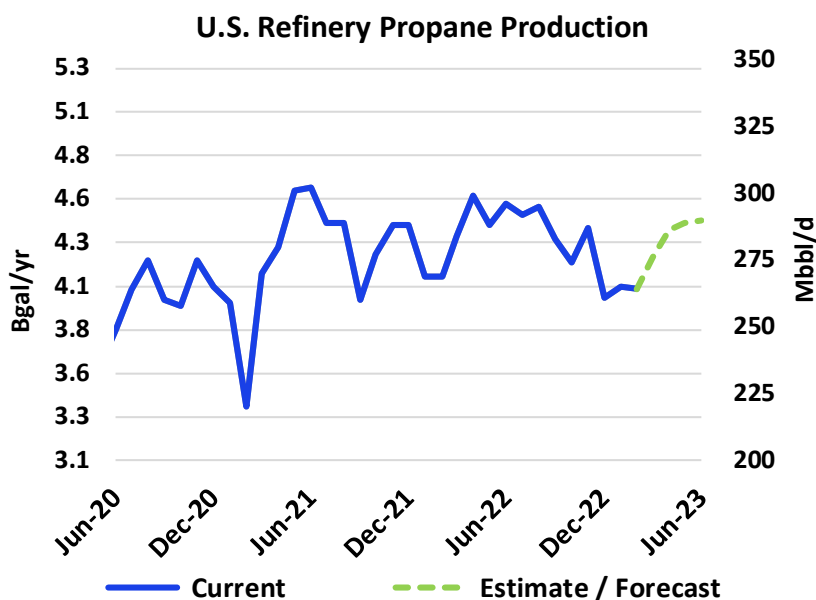


Table E: U.S. Propane Production Monthly and Weekly*						
(Mbbbl/d)	MONTHLY EIA			ESTIMATED		FORECAST
	Dec-22	Jan-23	M/M	Feb-23	Mar-23	Apr-23
Gas Plant	1,791	1,867	76	1,914	1,937	1,951
Refinery	261	265	4	264	276	286
TOTAL PROPANE	2,052	2,132	80	2,179	2,213	2,238
Propylene	229	234	5	233	241	277
TOTAL PRODUCTION	2,281	2,366	85	2,412	2,453	2,515
Weekly**	2,413	2,377	(37)	2,384	2,407	
Variance	132	11	(122)	(28)	(47)	

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

** Monthly production from EIA through January, weekly through the week of March 31, 2023.

MONTHLY GAS PLANT PRODUCTION INCREASES

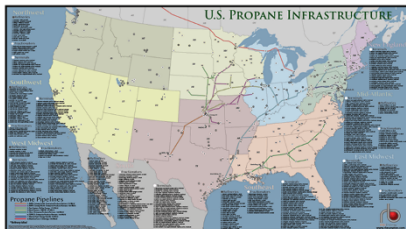
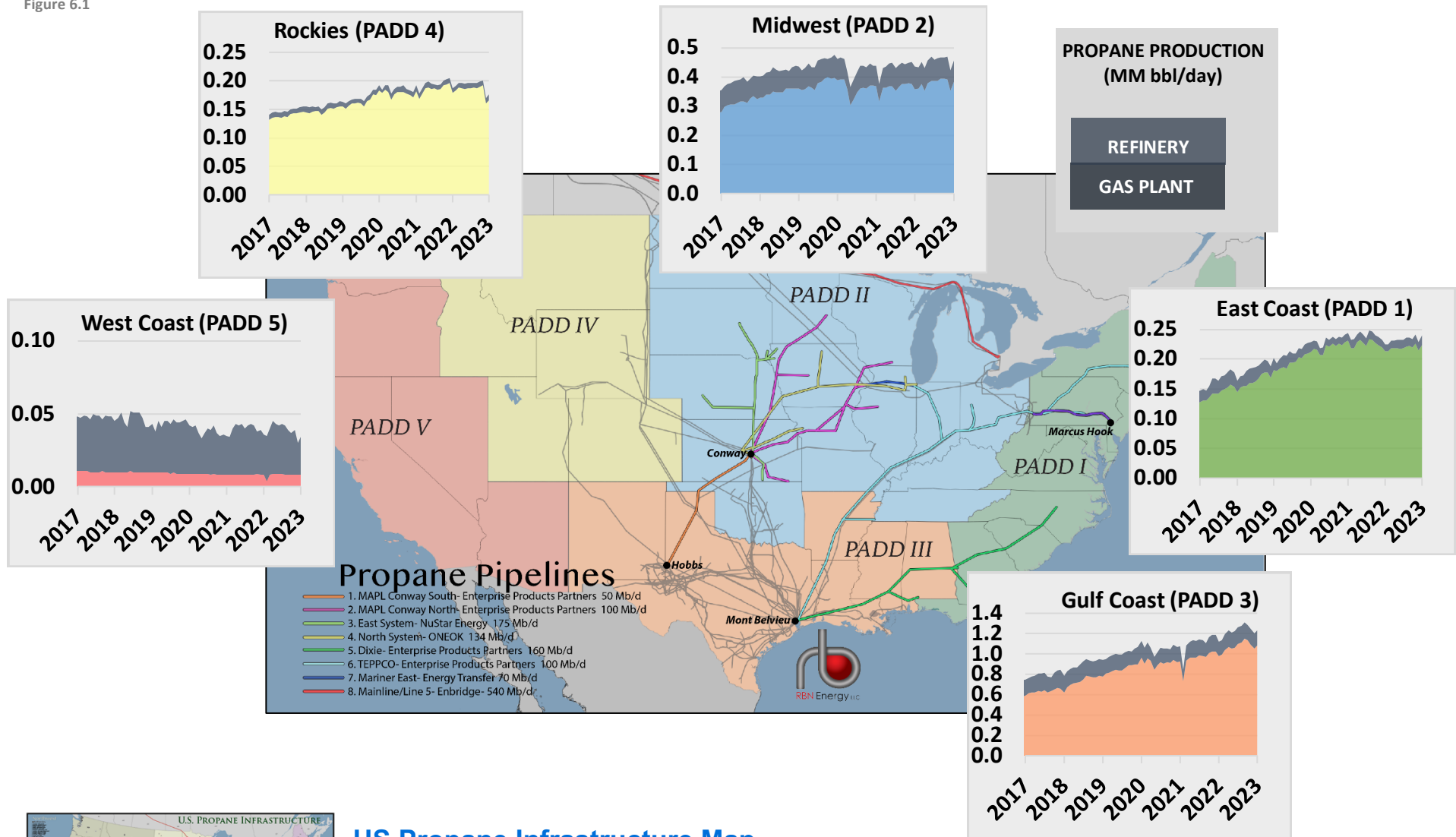
Propane gas plant production for January, as reported in the EIA Petroleum Supply Monthly issued March 31, came in higher for the first time in four months. Total U.S. propane production was 1,867 Mb/d, up 76 Mb/d from December but 93 Mb/d below September's record rate. PADD 3 production was also higher at 1,085 Mb/d, up 64 Mb/d from December but down 94 Mb/d from September's record rate. Based upon the latest EIA weekly data, we estimate that March gas plant production will further recover to 1,937 Mb/d. Our forecast model projects gas plant production to continue to recover in April to 1,951 Mb/d, only slightly below the September record high of 1,960 Mb/d. For 2023, we estimate propane production growth will be robust, averaging 1,980 Mb/d for the year, up 124 Mb/d, or 6.7%, from 2022. Almost all production growth for the year is in PADD 3, primarily the Permian Basin, with over a dozen new gas processing plants scheduled to come online over the next 12-18 months.

REFINERY PRODUCTION PARTIALLY RECOVERS

March refinery propane production increased by 12 Mb/d to 276 Mb/d as capacity utilization increased by 3 percentage points to 89%. We forecast that production in April will further recover to 286 Mb/d as refinery utilization improves to 91%, up 2 percentage points from March. For 2023, we expect refinery propane production will be relatively flat and average 284 Mb/d for the year, up 1 Mb/d from 2022, as capacity utilization increases slightly to 90%.

U.S. PROPANE INFRASTRUCTURE MAP

Figure 6.1

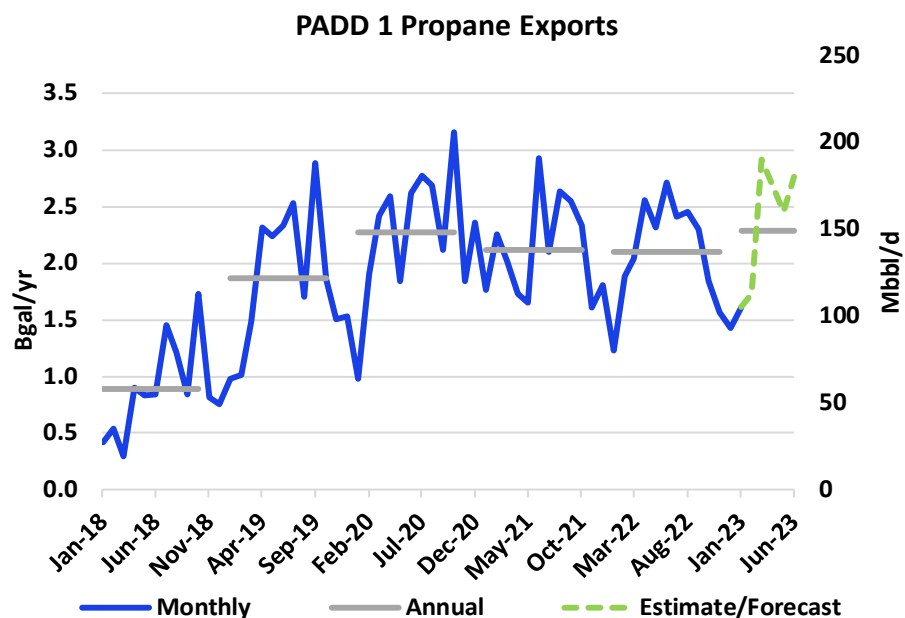
[US Propane Infrastructure Map](#)

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		
	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Production	297	312	287	322	315	329	321	228	240	244	248	250	252	255
Gas Plants	280	292	271	307	299	310	302	215	224	231	236	237	238	240
Refinery	17	21	15	15	17	19	19	13	16	13	12	13	14	15
Imports	43	57	41	52	16	16	18	33	44	35	40	13	13	14
Net Inter-PADD Transfers	284	273	202	229	219	198	184	218	210	172	176	173	152	146
TOTAL SUPPLY	624	643	530	604	550	543	523	479	494	451	464	436	417	415
Demand (Prod. Supplied)	577	526	437	388	311	290	255	443	404	372	298	247	223	202
Exports	121	137	133	247	221	208	227	93	105	113	190	175	160	181
Stock Change	(74)	(21)	(40)	(32)	18	45	41	(57)	(16)	(34)	(24)	14	34	32
TOTAL DISPOSITION	624	642	530	604	550	543	523	479	493	451	464	436	417	415
TOTAL INVENTORY	287	267	227	195	212	257	298	6,839	6,354	5,395	4,639	5,057	6,117	7,088

Figure 7.1



INSIGHTS & ANALYSIS

PADD 1 (East Coast) inventories drew by 756 Mbbl in March, which was above the 220 Mbbl build last year and the 5-year average draw of 378 Mbbl. Strong exports were the primary reason for the larger decline, leaving stocks at 4.6 MMbbl (195 MMgal). East Coast HDDs were 16% lower than March 2022 and 14% below the 10-year average for the month. This puts PADD 1 inventory 636 Mbbl above March 2022 and 966 Mbbl more than the 5-year average. Exports rose sharply to 170 Mb/d, up 57 Mb/d from February. Gas plant production in the Northeast continued to move higher, reaching 236 Mb/d.

PADD 1 OUTLOOK

Our propane model projects East Coast inventories to increase by 418 Mbbl in April to 5.1 MMbbl (212 MMgal), leaving stocks 1.4 MMbbl above the 5-year average. PADD 1 is projected to begin the injection season with April stocks at 5.1 MMbbl (212 MMgal), which is 1.8 MMbbl above last year and 1.4 MMbbl more than the 5-year average. As shown in Figure 7.1, East Coast exports are expected to increase to 175 Mb/d in April, well above the 2022 average of 136 Mb/d and the April 2022 rate of 167 Mb/d. Exports are projected to average 149 Mb/d in 2023, an increase of 15 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		
	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Production	551	594	536	595	579	601	584	423	456	456	457	460	462	463
Gas Plants	458	500	450	501	486	504	489	352	384	383	385	386	387	388
Refinery	92	94	86	94	94	98	95	71	72	73	72	74	75	75
Imports	52	60	57	38	26	10	4	40	46	49	29	21	8	4
Net Inter-PADD Transfers	(340)	(319)	(361)	(476)	(448)	(398)	(376)	(261)	(245)	(307)	(366)	(356)	(306)	(299)
TOTAL SUPPLY	263	335	232	157	158	213	212	202	257	197	120	125	164	168
Demand (Prod. Supplied)	387	460	452	277	127	103	76	297	353	385	213	101	79	61
Exports	4	5	5	7	6	7	7	3	4	4	5	5	5	6
Stock Change	(128)	(129)	(225)	(127)	24	103	128	(98)	(99)	(191)	(98)	19	79	102
TOTAL DISPOSITION	263	336	232	157	158	213	212	202	258	197	120	125	164	168
TOTAL INVENTORY	967	838	613	486	510	614	742	23,026	19,960	14,607	11,580	12,153	14,612	17,672

INSIGHTS & ANALYSIS

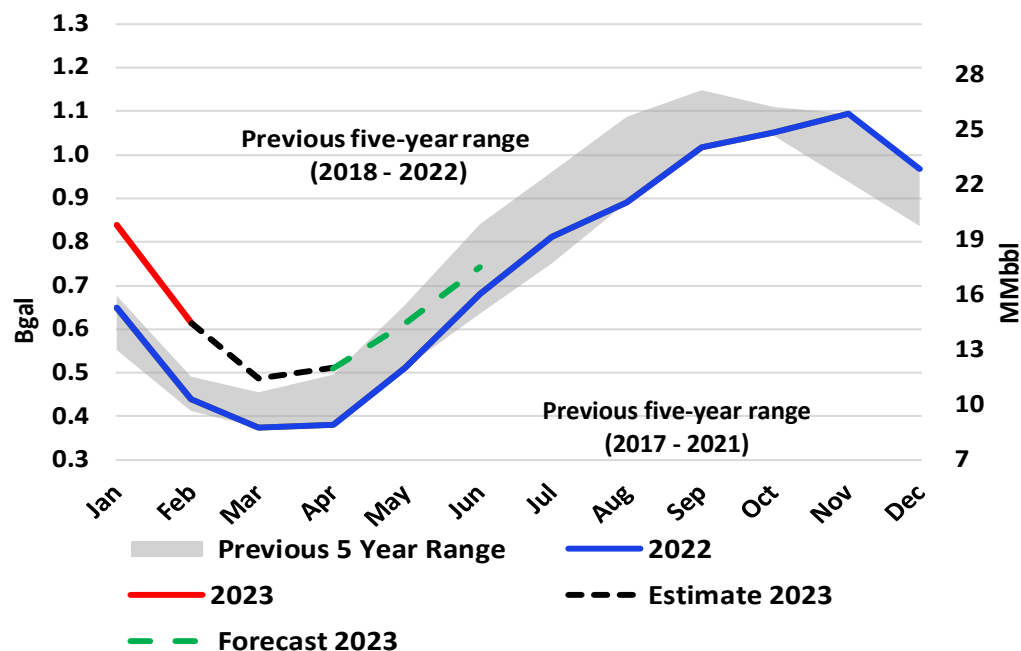
PADD 2 (Midwest) inventories declined by 3.0 MMbbl during March, which is well above the 1.5 MMbbl decline last year and the 5-year average draw of 883 Mbbl, with stocks ending at 11.6 MMbbl (486 MMgal). The Midwest market is in a more comfortable supply position compared to last year with 2.6 MMbbl more in storage. Production was flat in March at 457 Mb/d. Imports declined sharply to 29 Mb/d, which is 21 Mb/d less than last year and 16 Mb/d below the 2022 average rate.

PADD 2 OUTLOOK

Midwest inventories are forecast to build by 574 Mbbl in April compared to a 5-year average draw of 0.9 MMbbl, bringing ending inventories to 12.2 MMbbl (510 MMgal), 3.1 MMbbl above last year and 1.6 MMbbl above the 5-year average. Canadian imports into the Midwest are projected to average 24 Mb/d in 2023, down 21 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

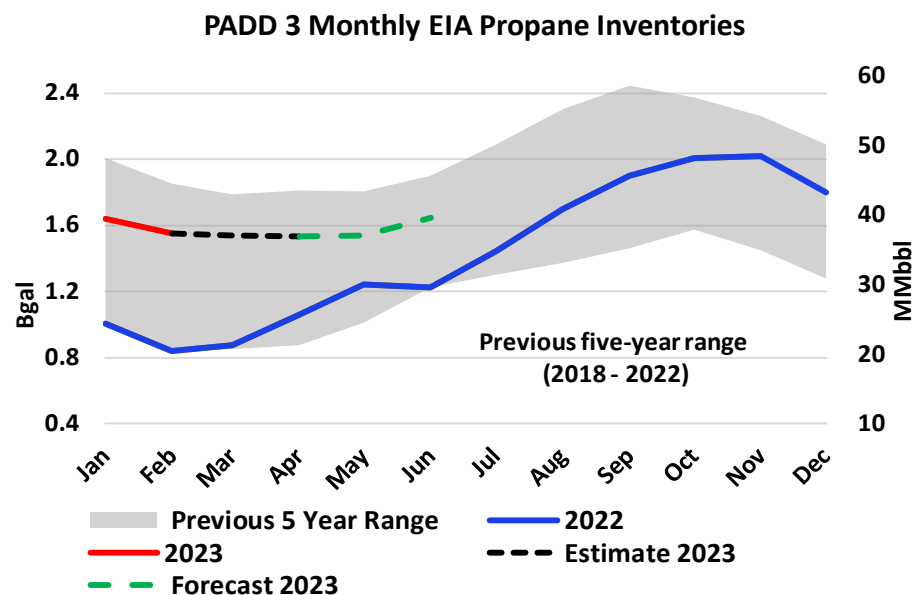


Source: EIA

PADD 3: PROPANE SUPPLY & DEMAND

Table H:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Production	1,568	1,603	1,488	1,672	1,637	1,710	1,672	1,204	1,231	1,265	1,284	1,299	1,313	1,327
Gas Plants	1,374	1,413	1,316	1,468	1,437	1,502	1,471	1,055	1,085	1,119	1,128	1,140	1,154	1,168
Refinery	194	190	172	204	201	207	201	149	146	146	157	159	159	159
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Inter-PADD Transfers	219	220	335	438	380	349	349	168	169	285	337	301	268	277
TOTAL SUPPLY	1,786	1,823	1,823	2,111	2,017	2,059	2,021	1,372	1,400	1,550	1,621	1,601	1,581	1,604
Demand (Prod. Supplied)	251	255	295	236	269	298	226	193	196	251	181	214	229	179
Exports	1,754	1,724	1,619	1,889	1,751	1,758	1,688	1,347	1,324	1,377	1,451	1,390	1,350	1,340
Stock Change	(219)	(156)	(91)	(14)	(4)	3	107	(168)	(120)	(78)	(11)	(3)	2	85
TOTAL DISPOSITION	1,786	1,823	1,823	2,111	2,017	2,059	2,021	1,372	1,400	1,550	1,621	1,601	1,581	1,604
TOTAL INVENTORY	1,798	1,642	1,551	1,537	1,533	1,536	1,643	42,812	39,104	36,927	36,588	36,494	36,569	39,128

Figure 7.3



Source: EIA

INSIGHTS & ANALYSIS

PADD 3 inventories declined by 340 Mbbl in March, compared to a build of 887 Mbbl in March 2022 and the 5-year average increase for the month of 106 Mbbl. The draw pulled Gulf Coast inventories down to 36.6 MMbbl (1.5 Bgal) at month's end, 15.7 MMbbl higher than last year and 7.9 MMbbl above the 5-year average. Propane exports from the Gulf Coast were robust at 1,451 Mb/d, up 74 Mb/d from February. We estimate that PADD 3 gas plant production increased to 1,128 Mb/d in March, up 9 Mb/d from January, continuing to recover from the winter weather-related curtailments in December.

PADD 3 OUTLOOK

April inventories are forecast to be relatively flat, declining by just 94 Mbbl, compared to a 5-year average build of 2 Mbbl. That will leave April ending stocks at 36.5 MMbbl (1.5 Bgal), which is 11.2 MMbbl more than last year and 5.8 MMbbl above the 5-year average. Gulf Coast propane production is expected to grow by 97 Mb/d in 2023, with over a dozen new gas processing plants in the Permian Basin scheduled to come online over the next 12-18 months.

PADD 4: PROPANE SUPPLY & DEMAND

Table I:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Production	217	223	211	244	237	245	238	167	171	179	187	188	188	189
Gas Plants	210	216	204	236	229	237	229	161	166	173	181	182	182	182
Refinery	8	7	7	8	8	9	8	6	5	6	6	7	7	7
Imports	38	40	26	25	6	7	8	29	31	22	19	5	5	6
Net Inter-PADD Transfers	(191)	(201)	(190)	(216)	(167)	(171)	(176)	(147)	(154)	(161)	(166)	(133)	(131)	(140)
TOTAL SUPPLY	64	62	47	53	76	81	69	49	48	40	40	60	62	55
Demand (Prod. Supplied)	81	78	64	66	69	74	69	62	60	55	51	55	57	55
Exports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock Change	(17)	(14)	(18)	(14)	7	7	(0)	(13)	(11)	(15)	(10)	5	5	(0)
TOTAL DISPOSITION	64	64	47	53	76	81	69	49	49	40	40	60	62	55
TOTAL INVENTORY	101	86	68	54	61	68	68	2,397	2,041	1,618	1,296	1,453	1,619	1,608

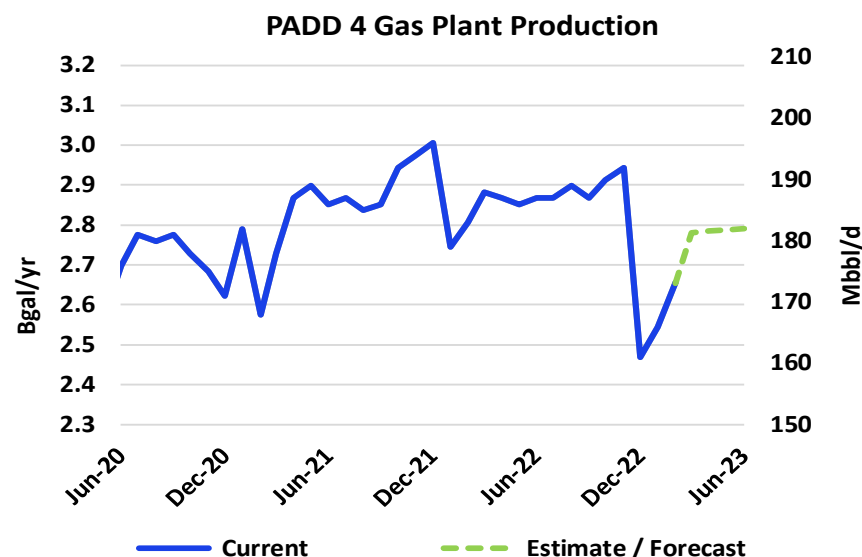
INSIGHTS & ANALYSIS

PADD 4 (Rocky Mountain) inventories fell by 322 Mbbl in March to 1.3 MMbbl (54 MMgal), which is 589 Mbbl less than last year and 344 Mbbl below the 5-year average. Gas plant production continued to recover in March, increasing to 181 Mb/d, up 8 Mb/d from February. Imports were slightly weaker at 19 Mb/d, down 3 Mb/d from the prior month.

PADD 4 OUTLOOK

PADD 4 is projected to begin the injection season with April stocks at 1.5 MMbbl (61 MMgal), which is 611 Mbbl below last year and 225 Mbbl lower than the 5-year average. As shown in Figure 7.4, PADD 4 gas plant production is expected to remain relatively flat in April at 182 Mb/d and average 180 Mb/d for the year, down 5 Mb/d from 2022.

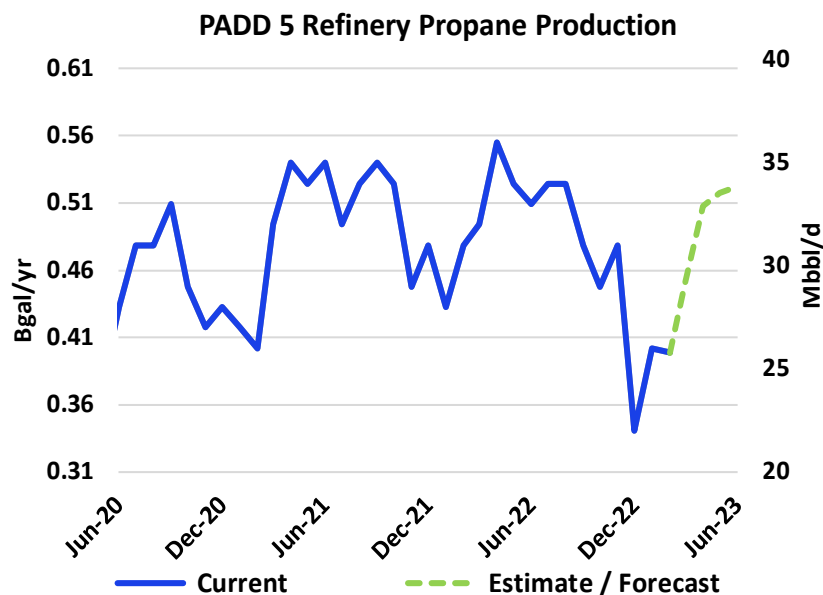
Figure 7.4



PADD 5: PROPANE SUPPLY & DEMAND

Table J:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Production	39	44	41	47	50	53	52	30	34	35	36	40	41	41
Gas Plants	10	10	11	9	9	9	9	8	8	9	7	7	7	7
Refinery	29	34	30	38	41	44	43	22	26	26	29	33	34	34
Imports	46	56	52	49	36	21	26	35	43	44	37	29	16	21
Net Inter-PADD Transfers	29	26	14	26	17	21	20	22	20	12	20	14	16	16
TOTAL SUPPLY	113	126	106	121	104	95	97	87	97	90	93	82	73	77
Demand (Prod. Supplied)	94	108	80	80	66	55	59	72	83	68	62	53	43	47
Exports	47	31	33	48	37	29	30	36	24	28	37	30	22	24
Stock Change	(27)	(14)	(6)	(7)	0	11	8	(21)	(11)	(5)	(5)	0	8	7
TOTAL DISPOSITION	113	125	106	121	104	95	97	87	96	90	93	82	73	77
TOTAL INVENTORY	62	48	42	35	35	46	54	1,480	1,153	999	834	839	1,099	1,296

Figure 7.5



INSIGHTS & ANALYSIS

PADD 5 (West Coast) inventories declined by 165 Mbbl in March to 834 Mbbl (35 MMgal), leaving stocks 298 Mbbl above last year and 251 Mbbl above the 5-year average. Refinery production was slightly higher at 29 Mb/d as capacity utilization increased by 4 percentage points to 85%. West Coast exports were much stronger than the prior month at 37 Mb/d while imports weakened to 37 Mb/d.

PADD 5 OUTLOOK

Our propane model projects West Coast inventories to remain relatively flat in April at 839 Mbbl (35 MMgal), leaving stocks 128 Mbbl above the 5-year average. As shown in Figure 7.5, refinery production in PADD 5 is expected to rebound to 33 Mb/d in April as capacity utilization improves to 87%. Imports are projected to decline to 29 Mb/d and average 28 Mb/d for the year, up 1 Mb/d from 2022. West Coast exports for April are estimated at 30 Mb/d, down 7 Mb/d from the prior month. PADD 5 exports are forecast to average 27 Mb/d for the year, unchanged from 2022.

KEY ENERGY PRICES

Table K:		Prices									
Product	Units	Current 6-Apr-23	30-Mar-23	Prior Week W/W	W/W %	6-Mar-23	Prior Month M/M	M/M %	6-Apr-22	Prior Year Y/Y	Y/Y %
Brent Crude	\$/bbl	85.1	79.3	5.9	7.4%	86.2	(1.1)	-1.2%	101.1	(16.0)	-15.8%
WTI Cushing Crude	\$/bbl	80.7	74.4	6.3	8.5%	80.5	0.2	0.3%	96.2	(15.5)	-16.1%
Henry Hub Natural Gas	\$/MMBtu	2.01	2.10	(0.09)	-4.4%	2.57	(0.56)	-21.8%	6.03	(4.02)	-66.6%
Propane											
Mont Belvieu Non-TET	c/gal	82.3	79.2	3.1	3.9%	90.8	(8.5)	-9.4%	128.7	(46.3)	-36.0%
Mont Belvieu TET	c/gal	82.3	79.4	2.9	3.6%	90.8	(8.5)	-9.4%	130.2	(47.9)	-36.8%
Conway	c/gal	80.3	75.9	4.5	5.9%	84.1	(3.8)	-4.5%	126.9	(46.5)	-36.7%
Edmonton*	c/gal	61.4	56.2	5.2	9.2%	60.9	0.5	0.8%	105.0	(43.5)	-41.5%
European (ARA)	\$/MT	515.7	544.5	(28.8)	-5.3%	627.3	(111.6)	-17.8%	756.9	(241.2)	-31.9%
Asian (FEI)	\$/MT	584.6	597.0	(12.4)	-2.1%	678.0	(93.4)	-13.8%	825.4	(240.8)	-29.2%

Figure 8.1

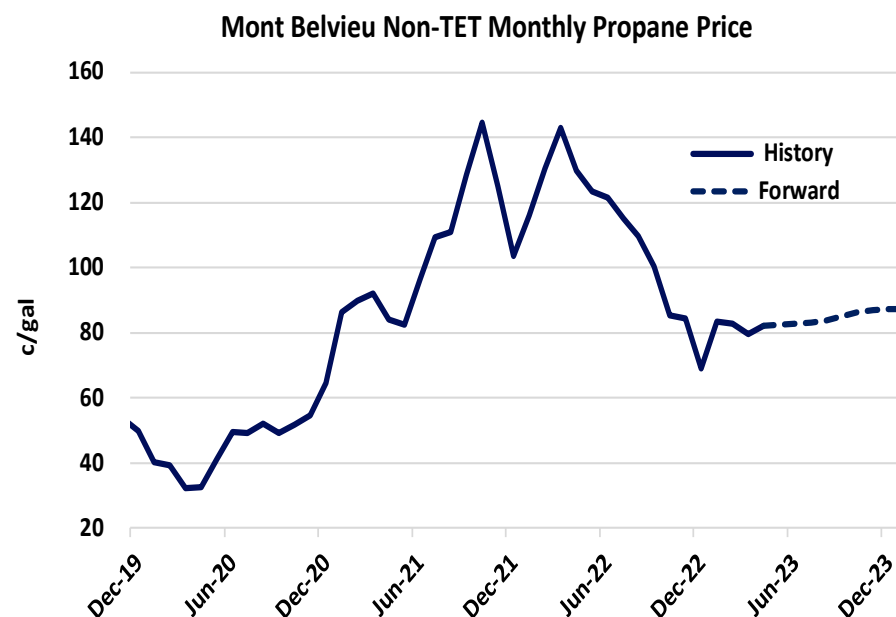
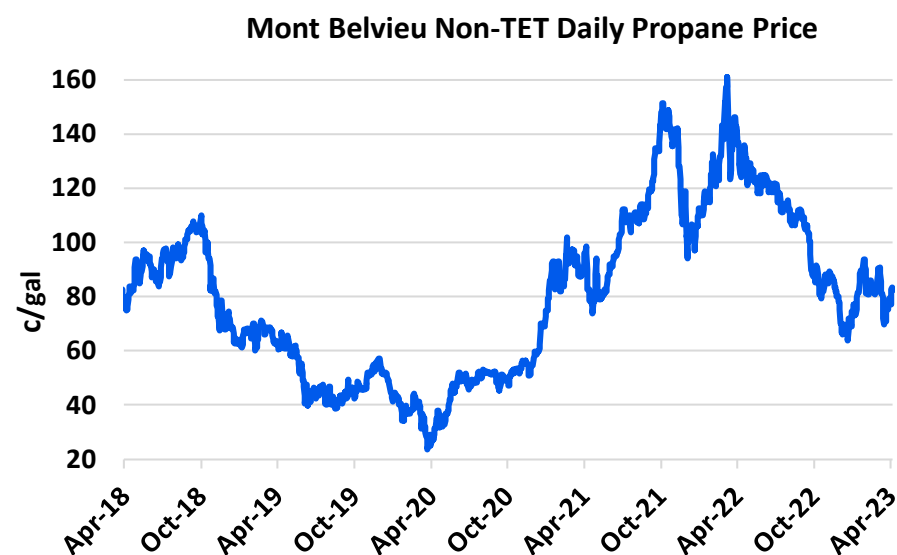


Figure 8.2



MONTHLY PROPANE PRICE TRENDS

Figure 8.3

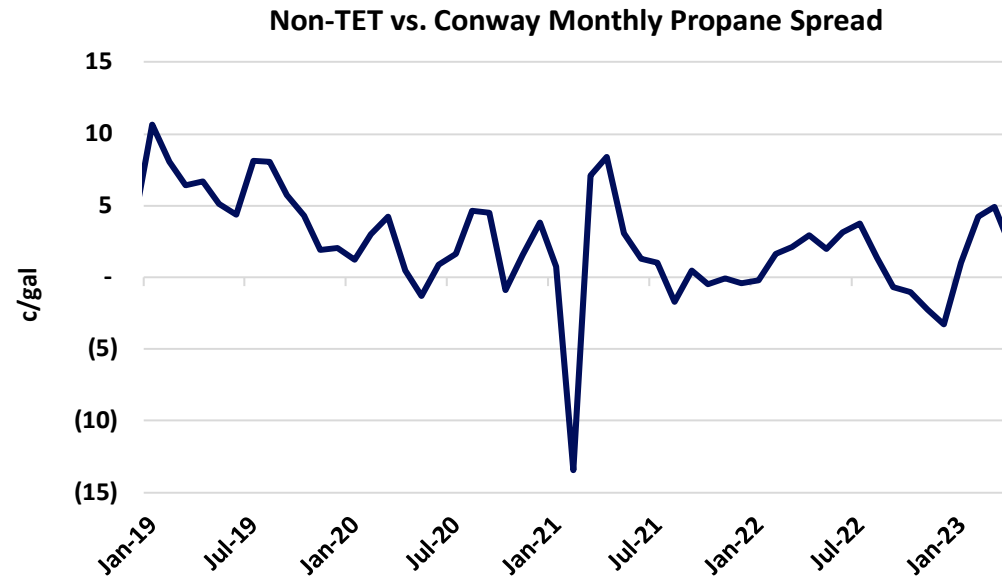


Figure 8.4

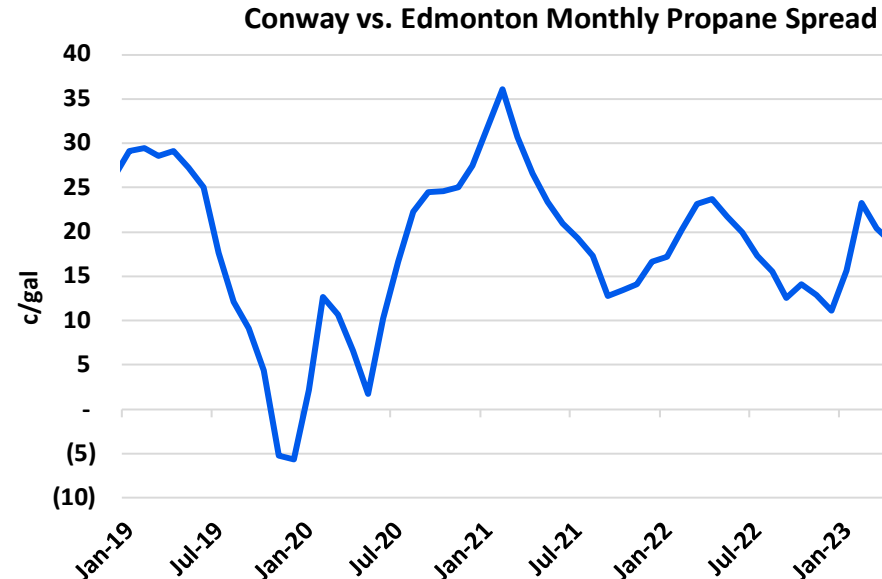


Figure 8.5

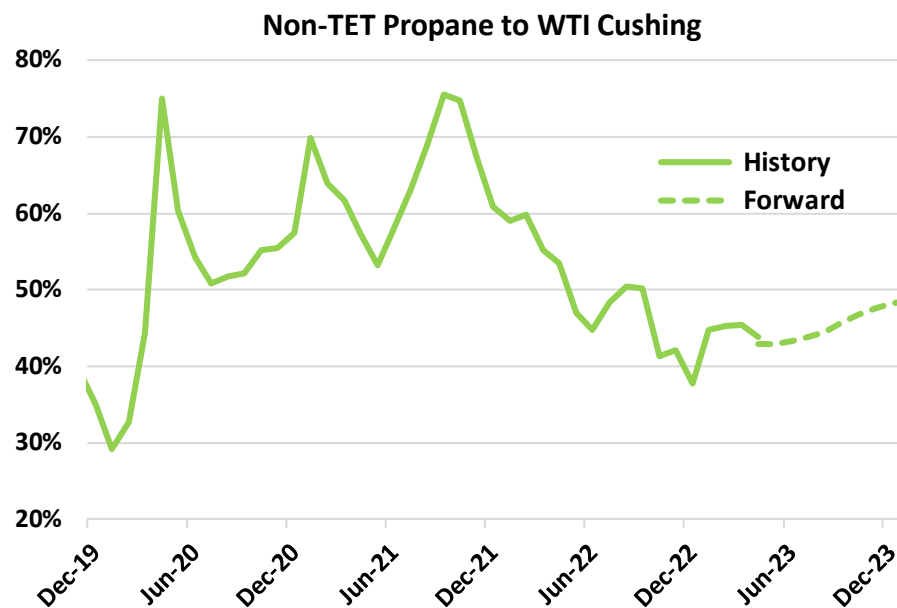


Table L: MB TET Propane / WTI Cushing					
%	2020	2021	2022	2023	Y/Y %
Jan	31.5%	70.4%	59.2%	44.6%	-24.6%
Feb	32.8%	65.0%	60.4%	44.7%	-26.0%
Mar	45.3%	62.0%	55.6%	45.6%	-18.1%
Q1	36.6%	65.8%	58.3%	45.0%	-22.9%
Q2	60.5%	55.5%	48.8%		
Q3	50.6%	69.2%	49.5%		
Q4	56.0%	67.7%	40.8%		
Year	51.0%	64.6%	49.3%	44.9%	-9.0%

INTERNATIONAL PROPANE PRICE SPREADS

Figure 9.1

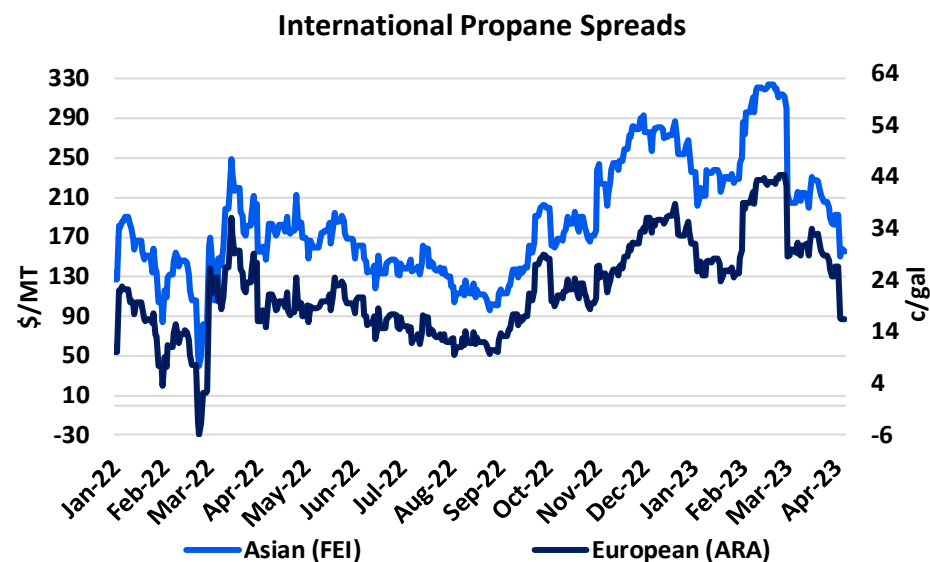


Table M: Asian FEI / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Jan	251.5	186.5	154.3	228.9	48.3%
Feb	174.1	96.5	115.0	311.6	171.0%
Mar	151.8	102.4	181.7	209.4	15.2%
Q1	192.9	129.5	151.5	247.9	63.6%
Q2	97.6	106.1	163.8		
Q3	91.0	101.1	134.0		
Q4	175.0	163.6	232.5		
Year	139.1	125.1	170.6	242.9	42.4%

Table N: European ARA / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Jan	181.6	56.6	88.3	141.0	59.7%
Feb	110.5	46.5	44.4	221.3	398.9%
Mar	72.0	56.6	134.5	156.4	16.2%
Q1	121.6	53.5	90.5	171.3	89.2%
Q2	44.8	50.7	98.3		
Q3	49.8	48.3	79.3		
Q4	89.5	111.3	147.9		
Year	76.4	66.0	104.1	167.1	60.5%

Figure 9.2

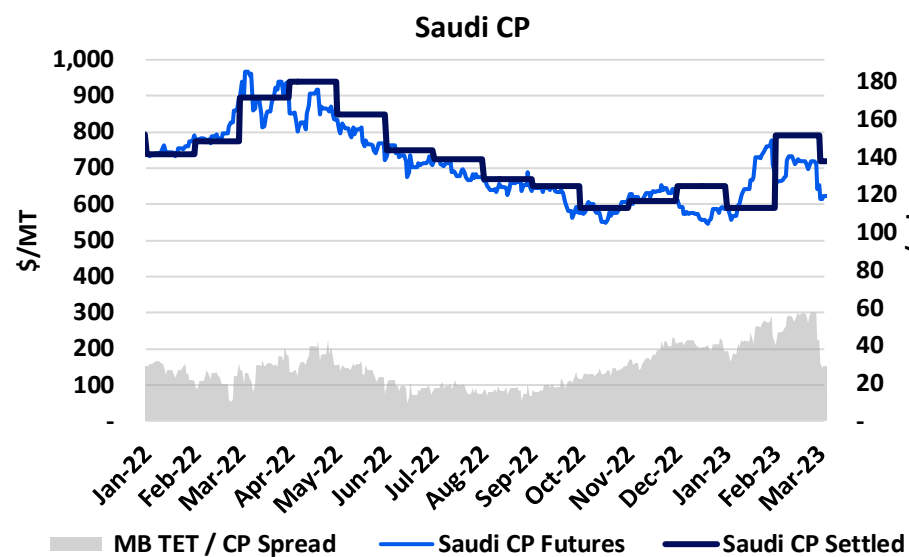


Table O: Saudi CP / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Jan	275.3	142.7	143.6	230.7	60.6%
Feb	197.3	116.7	112.8	275.7	144.4%
Mar	97.1	95.5	150.8	150.0	-0.6%
Q1	189.7	118.4	136.5	216.9	58.9%
Q2	103.4	74.8	135.3		
Q3	107.5	77.5	91.6		
Q4	150.0	144.3	178.4		
Year	137.6	103.7	135.4	211.8	56.4%

U.S. PROPANE SUPPLY & DEMAND BALANCE DETAIL

Table P:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Gas Processing	2,332	2,431	2,251	2,522	2,459	2,562	2,501	1,791	1,867	1,914	1,937	1,951	1,968	1,985
Refinery Propane	340	345	311	359	361	376	365	261	265	264	276	286	289	290
Imports	178	214	176	164	84	53	55	137	164	149	126	67	41	44
TOTAL SUPPLY	2,850	2,989	2,737	3,045	2,903	2,991	2,922	2,189	2,296	2,328	2,339	2,304	2,298	2,319
Product Supplied	1,389	1,427	1,329	1,047	843	821	684	1,067	1,096	1,130	804	669	631	543
ResCom	858	812	755	772	529	413	322	659	623	642	593	420	317	255
Crop Drying	136	77	57	40	40	40	40	105	59	48	30	31	30	31
Industrial	113	120	108	105	87	89	87	87	92	92	80	69	68	69
Petrochemicals	187	233	204	222	209	226	218	143	179	174	171	166	174	173
PDH	72	72	93	103	101	117	113	55	55	79	79	80	90	90
Balancing	24	114	111	(195)	(122)	(64)	(95)	18	87	94	(149)	(97)	(49)	(75)
Exports	1,926	1,897	1,790	2,192	2,016	2,002	1,953	1,479	1,457	1,522	1,683	1,600	1,537	1,550
Stock Change	(465)	(335)	(381)	(194)	45	169	285	(357)	(257)	(324)	(149)	35	130	226
TOTAL DISPOSITION	2,850	2,989	2,738	3,045	2,903	2,991	2,922	2,189	2,296	2,328	2,339	2,304	2,298	2,319
TOTAL INVENTORY	3,215	2,882	2,501	2,307	2,352	2,521	2,805	76,554	68,612	59,546	54,936	55,996	60,017	66,792
Last Year Inventory	2,681	2,031	1,559	1,522	1,688	2,085	2,272	63,839	48,357	37,128	36,244	40,185	49,644	54,099
Stock M/M Δ	(465)	(335)	(381)	(194)	45	169	285	(11,067)	(7,967)	(9,066)	(4,610)	1,060	4,020	6,775
Last Year Stock M/M Δ	(346)	(642)	(473)	(38)	165	397	188	(8,246)	(15,283)	(11,256)	(899)	3,930	9,455	4,470

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

PADD AVERAGE HEATING DEGREE DAYS (HDDs)

Figure 10.1

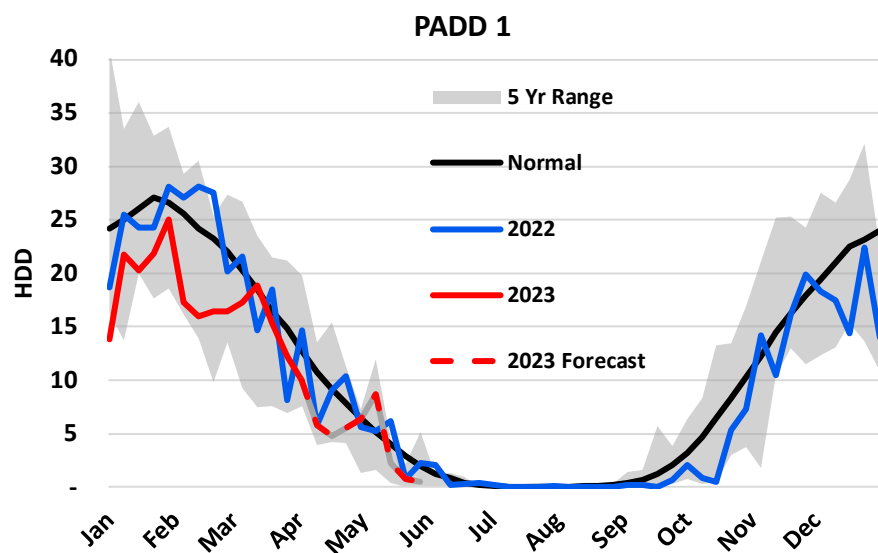


Figure 10.2

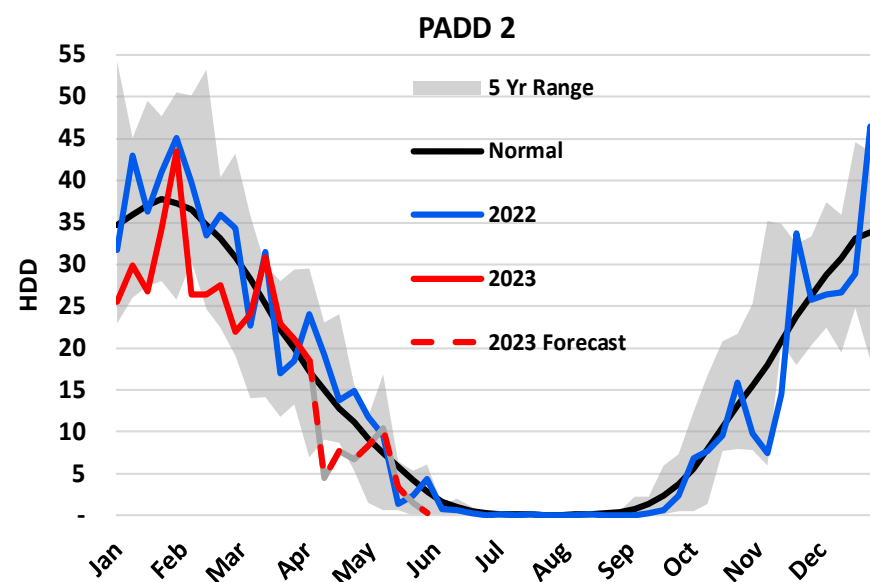
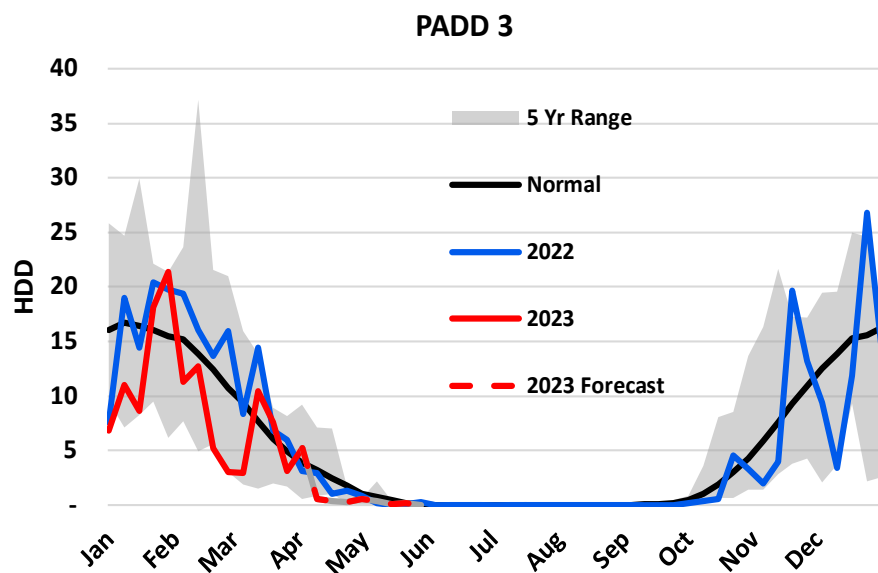


Figure 10.3



INSIGHTS & ANALYSIS – MARCH 2023

Our weather forecast data (Figures 10.1-10.5) shows propane population-weighted heating degree days (HDDs) by PADD. March HDDs were 11% more than March 2022. As a result, ResCom propane demand for March 2023 was 18 Mb/d higher than last March. Not surprisingly, most of the year-on-year increase in March heating demand was in PADD 2, which was up 39 Mb/d, while PADD 1 HDD demand was up by 21 Mb/d from the prior year.

2022–23 WINTER SEASON RECAP

March came in colder than normal with total HDDs 10% above last year and the 4% higher than the 5-year average. Our weather data shows that this winter season (October–March) was 4% colder than last year and in line with the 5-year average. Total ResCom demand for this winter season is projected at 3,405 Mb/d which is 2% above last winter and on par the annual average. Overall, it was a fairly normal winter with PADD 5 being with only region with colder-than-normal temperatures and higher winter demand.

Figure 10.4

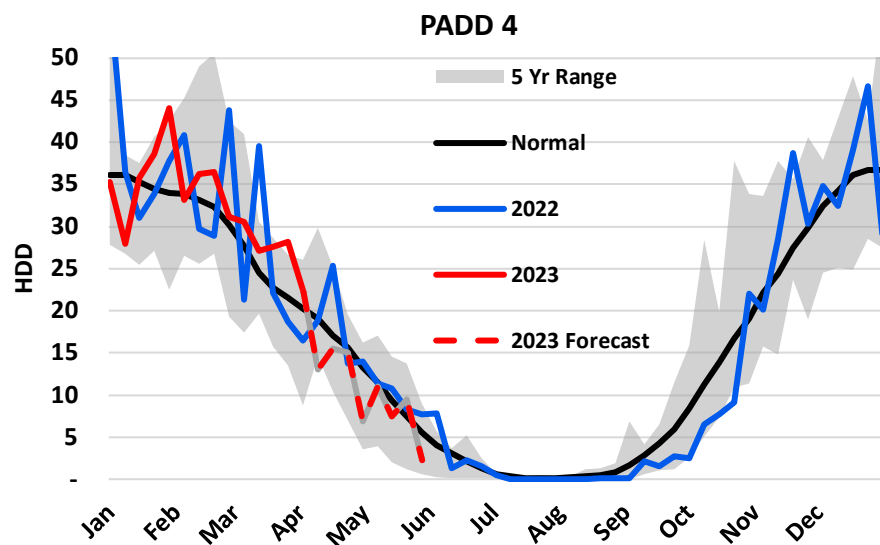
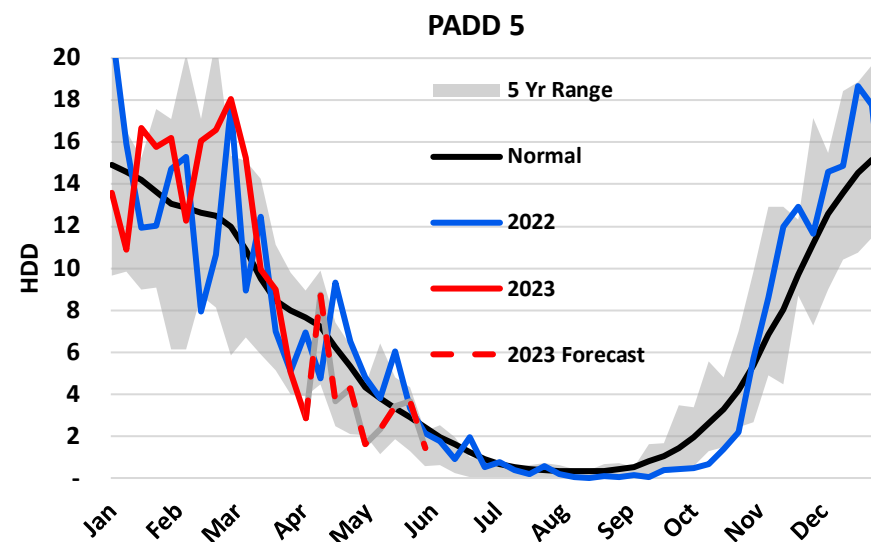


Figure 10.5



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