



RBN U.S. Propane Billboard

U.S. Propane Market Update & Outlook

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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		
	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Production	2,969	3,074	2,979	3,091	3,102	2,912	3,122	2,356	2,361	2,365	2,374	2,383	2,391	2,398
Gas Plants	2,622	2,719	2,634	2,724	2,749	2,581	2,769	2,081	2,088	2,090	2,092	2,111	2,119	2,127
Refinery	347	355	346	367	353	331	353	275	273	274	282	271	271	272
Imports	107	124	119	146	154	176	139	85	95	95	112	118	145	107
TOTAL SUPPLY	3,076	3,198	3,098	3,237	3,256	3,088	3,262	2,441	2,456	2,459	2,486	2,501	2,535	2,505
Demand (Prod. Supplied)	801	1,163	1,152	1,522	1,596	1,368	1,119	636	893	914	1,169	1,226	1,123	859
Exports	2,025	2,208	2,143	2,218	2,161	2,037	2,252	1,607	1,696	1,701	1,704	1,660	1,673	1,730
Stock Change	248	(174)	(214)	(487)	(501)	(317)	(109)	197	(134)	(170)	(374)	(385)	(260)	(84)
TOTAL DISPOSITION	3,074	3,196	3,082	3,254	3,256	3,088	3,262	2,440	2,455	2,446	2,499	2,501	2,535	2,505
TOTAL INVENTORY*	4.3	4.1	3.9	3.4	2.9	2.6	2.5	102.2	98.0	92.9	81.3	69.4	61.9	59.3

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

MONTHLY HIGHLIGHTS

- December U.S. propane inventories drew by 11.6 Mbbl, which was in line with the 5-year average decline for the month but below the 8 MMbbl decline in December 2022. December 2023 was one of the warmest on record, but strong exports kept inventories in check.
- The EIA reported weekly propane/propylene stocks for PADD 2 were overstated by over 5 MMbbl for the weeks ended November 10, 2023, to December 15, 2023. The EIA issued corrected stock levels for the period which significantly reduced the inventory cushion for the region, and we have updated our propane model accordingly.
- New inventory data for purity propane labeled “Propane, fractionated and ready for sale” was issued in the EIA Petroleum Supply Monthly (PSM) released on December 29, 2023. The data shows that ~30% of U.S. propane inventory is contained in Y-grade. We look at the new inventory information in more detail in our Market Spotlight section.
- Gulf Coast LPG export capacity continues to be tight with volumes over 1.9 MMb/d for the month, essentially equal to the capacity of the four major terminals (Enterprise, Energy Transfer, Phillips 66 and Targa). We expect tight export capacity to be a key market factor in 2024.
- U.S.-Asia propane export economics were healthy in December with the arb narrowing but remaining open (profitable), supported by a wide differential between Asian FEI and Mont Belvieu prices.

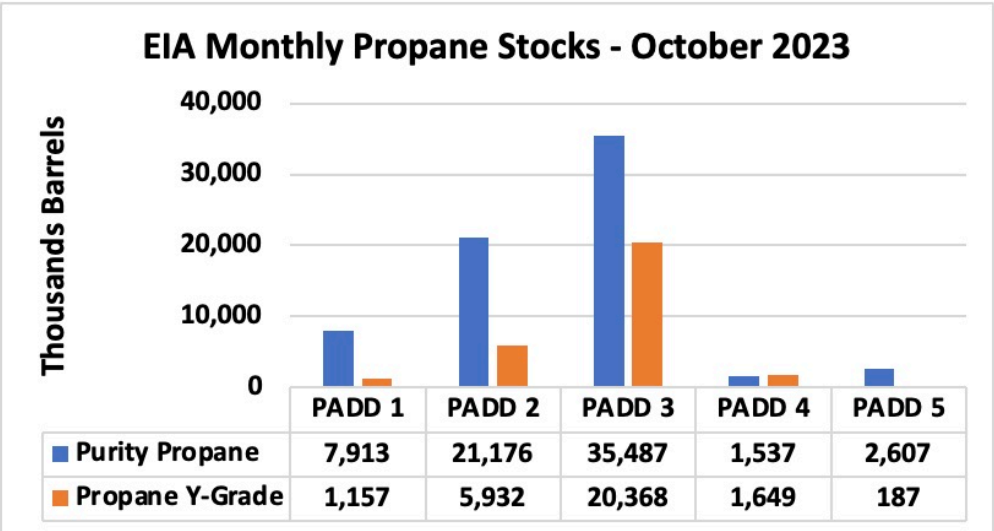
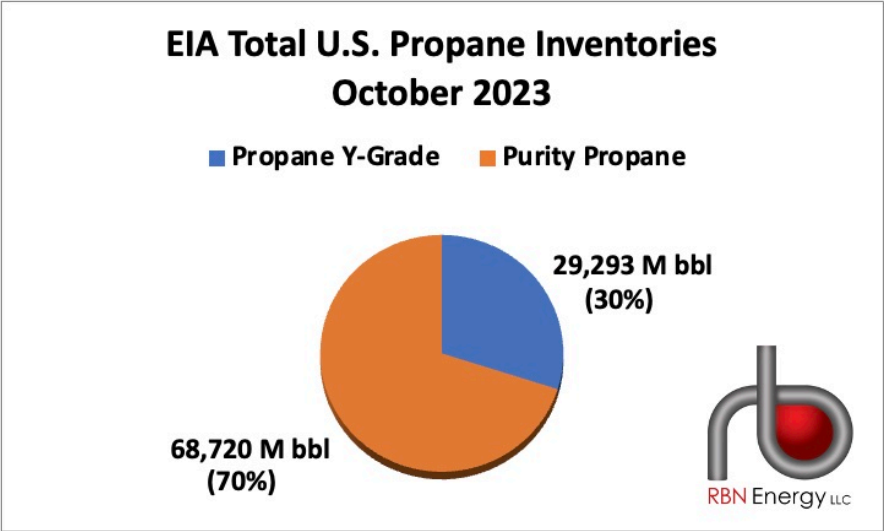
MARKET OVERVIEW

The headliner for this month’s report is strong propane exports, especially from the U.S. Gulf Coast to Asia, which have shrunk the inventory cushion to last year and the 5-year average. Propane exports have been near record levels over the last three months, which has tightened dock capacity on the Gulf Coast. Exports are expected to remain robust in January and the weather is forecast to be colder than normal, which should support a strong draw for the month. We did get a little more bullish price action in the market in late December with propane hitting almost 44% of WTI, but we are already back to 40% so propane remains relatively cheap.

MONTHLY PROPANE MARKET SPOTLIGHT

EIA Issues New Purity Propane Inventory Data

The Energy Information Administration (EIA) reported new inventory data for purity propane labeled “Propane, fractionated and ready for sale” in the Petroleum Supply Monthly (PSM) released on December 29, 2023. Propane, fractionated and ready for sale, includes stocks of fractionated propane but excludes the propane component of unfractionated mixed products (e.g., propane components of y-grade, refinery-grade propylene, and butane-propane mixes). As shown on the left-hand chart below, total U.S. propane stocks for October 2023 were 70% purity and 30% contained in Y-grade. Most of the Y-grade propane was in PADD 2 (Midwest) and PADD 3 (Gulf Coast), where the vast majority of NGL fractionation and storage capacity is located (right-hand chart below).

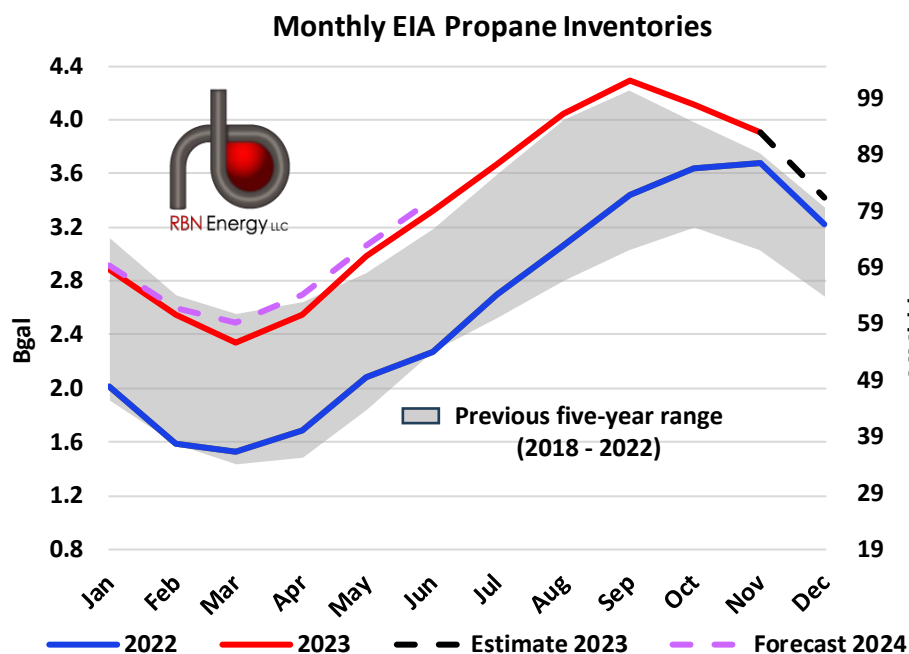


Sources: EIA Petroleum Supply Monthly December 2023

U.S. PROPANE INVENTORIES

Table B: MM gal							M bbl					
	MONTHLY EIA			ESTIMATED		FORECAST	MONTHLY EIA			ESTIMATED		FORECAST
	Sep-23	Oct-23	M/M	Nov-23	Dec-23	Jan-24	Sep-23	Oct-23	M/M	Nov-23	Dec-23	Jan-24
PADD 1 (East Coast)	356	381	25	415	333	250	8,469	9,070	601	9,870	7,933	5,953
PADD 2 (Midwest)	1,177	1,139	(39)	1,055	907	758	28,026	27,108	(918)	25,109	21,585	18,038
PADD 3 (Gulf Coast)	2,515	2,346	(169)	2,181	1,957	1,723	59,886	55,855	(4,031)	51,934	46,584	41,030
PADD 4 (Rocky Mountains)	132	134	2	138	126	114	3,139	3,186	47	3,294	3,006	2,713
PADD 5 (West Coast)	111	117	6	114	94	70	2,646	2,794	148	2,717	2,231	1,677
TOTAL PROPANE	4,291	4,117	(174)	3,903	3,416	2,915	102,166	98,013	(4,153)	92,924	81,338	69,410
Propylene	51	56	5	56	55	45	1,218	1,341	123	1,337	1,309	1,064
TOTAL INVENTORIES	4,342	4,173	(169)	3,959	3,471	2,960	103,384	99,354	(4,030)	94,260	82,647	70,474

Figure 1.1



Source: EIA, RBN Forecast

ANALYSIS & INSIGHTS

Total U.S. propane inventories fell by 11.6 MMbbl in December, which was in line with the 11 MMbbl decline last year and the 11.5 MMbbl 5-year average draw for the month. December total U.S. propane stocks were 81.3 MMbbl (3.4 Bgal) which is 4.7 MMbbl, or 6.1%, above last year and 10.6 MMbbl, or 15%, higher than the 5-year average. PADD 3 had a typical draw of 5.3 MMbbl for the month, slightly more than the 5.1-MMbbl decline for the period in 2022. Gulf Coast inventories are now only 3.8 MMbbl, or 8.8% above December 2022. PADD 2 inventories declined by 3.5 MMbbl, which was slightly above the 3.3 MMbbl average draw for the month. Midwest stocks are now only 0.5 MMbbl, or 2.6%, higher than the 5-year average. PADD 1 inventories drew by 2.0 MMbbl, which is above the 5-year average decrease of 1.2 MMbbl. PADD 4 stocks declined by 288 Mbbl to 3 MMbbl, which is 779 Mbbl (35%) higher than the 5-year average. PADD 5 inventories fell by 486 Mbbl to 2.2 MMbbl, which is 557 Mbbl, or 33%, above the 5-year average (2018-2022)

INVENTORY OUTLOOK

January total U.S. propane inventories are projected to fall by 11.9 MMbbl, compared to an 8-MMbbl draw last year and the 5-year average decline of 11.2 MMbbl. This will leave total stocks at 69.4 MMbbl (2.9 Bgal), which is 0.8 MMbbl, or 1.2%, more than last year and 10 MMbbl, or 16.8%, above the 5-year average (2019-2023).

PROPANE MARKET UPDATE

PROPANE TO WTI RATIO SLIGHTLY STRONGER

West Texas Intermediate (WTI) crude oil prices remained under pressure during December, trading around \$70/bbl, as the market weighed the demand impacts of mixed economic signals out of the U.S. and China, along with continuing concerns regarding the Ukraine conflict and the Israel-Hamas war. WTI closed at \$71.65/bbl on December 29, down \$2.42/bbl, or 3.3%, from December 1. Mont Belvieu propane prices were stronger than crude oil in December. The OPIS non-TET (Enterprise) price was up 2.7 c/gal from the beginning of the month to 74.3 c/gal as of December 29, while OPIS TET (Energy Transfer) propane increased by 1.2 c/gal to 71.4 c/gal over the same period. As a result, the non-TET vs. TET price spread widened, with non-TET trading at a 2.9 c/gal premium on December 29. The December OPIS monthly average price was 68.9 c/gal for non-TET and 67.4 c/gal for TET, which was 4.9 c/gal and 3.4 c/gal above the November averages, respectively. Conway propane (OPIS) averaged 64.9 c/gal for the month, which represented a 4 c/gal discount to the average non-TET price. The Conway spread to Mont Belvieu has narrowed recently with a 0.9 c/gal discount as of January 5.

The benchmark non-TET propane-to-WTI Cushing ratio (Figure 1.2) closed at 43.5% as of December 29, up 2.7 percentage points from the beginning of the month. The ratio has since fallen back to 40% as of January 5. The current forward curves project the propane-to-WTI ratio to average ~40% through April, which is 3 percentage points higher compared to the forward curves at the beginning of December. As shown in Figure 1.3, the forward curve for January (red line) is up ~2-3 c/gal in the short-term (February-April) compared to the forward curve in December (yellow line).

Figure 1.2

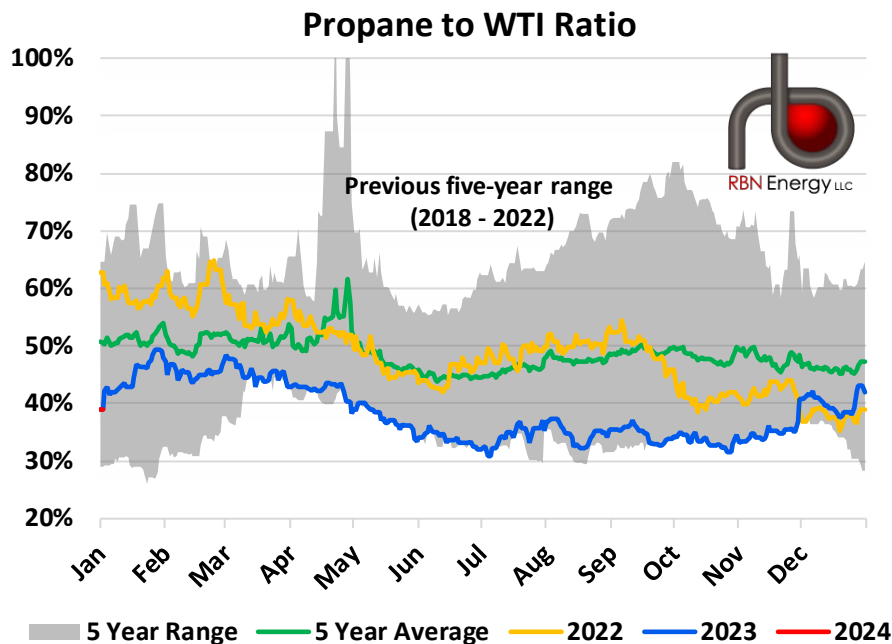
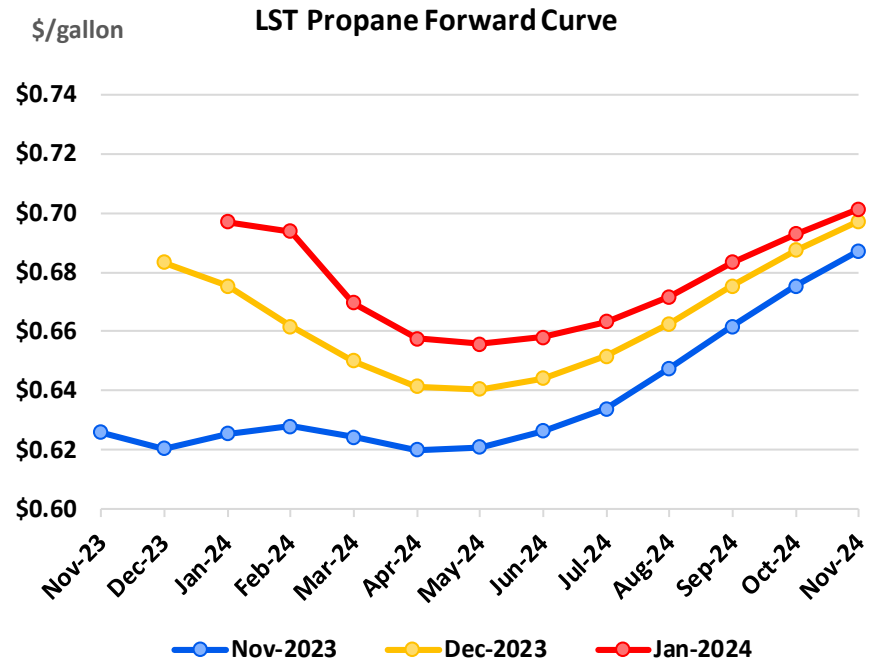


Figure 1.3



CONWAY VS. MONT BELVIEU PROPANE PRICES

CONWAY PRICE DISCOUNT TO MONT BELVIEU WIDENS

The Conway spot propane's (OPIS) discount to Mont Belvieu Non-TET (Figure 2.5) averaged 4 c/gal during December, compared to a 2.1 c/gal discount in November and a 1.8 c/gal discount in October. In December 2022, Conway was at an average **premium** of 3.3 c/gal while in 2018 it was at a discount of 4.1 c/gal. The 5-year average Conway discount for December is 1.2 c/gal.

As of January 5, the Conway spot propane (OPIS) discount to Mont Belvieu Non-TET **had declined to 0.9 c/gal**, down from 4.9 c/gal on December 1.

CONWAY - BELVIEU PROPANE 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 or spread between the two prices 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 (export demand pull) or keep barrels in the Midwest for domestic demand. The current forward curves are now projecting Mont Belvieu prices to trade close to Conway for the remainder of the winter heating season (January– March).

For 2024, the forward curves project that Gulf Coast propane prices will trade above Conway for most of the year but flip to a discount in October, with Mont Belvieu averaging 0.3 c/gal over Conway compared to a 2 c/gal premium last year.

Figure 2.5

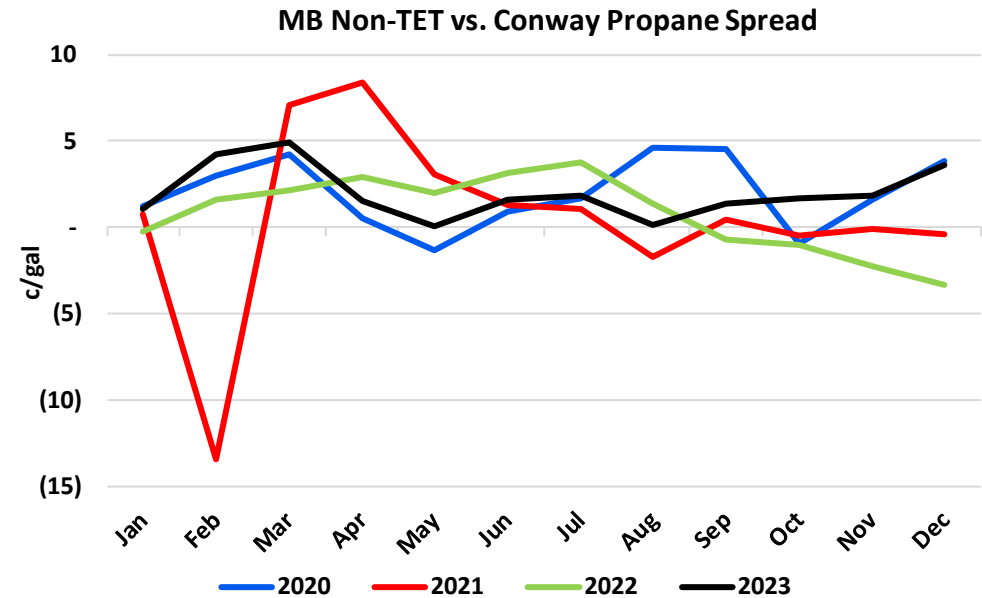
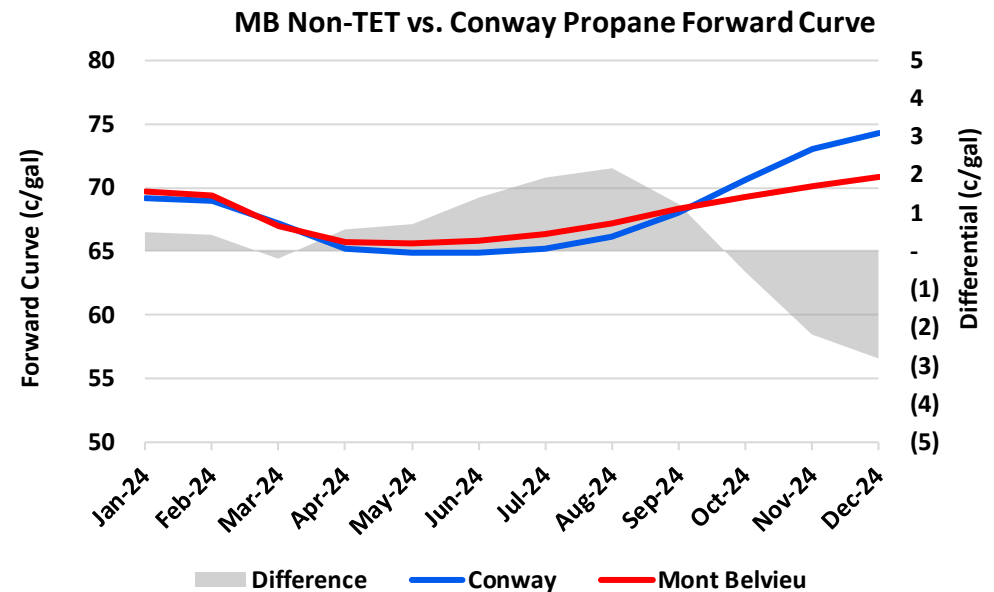


Figure 2.6



U.S. PROPANE DEMAND

Table C:	MM gal / month						M bbl / day					
	MONTHLY			ESTIMATED		FORECAST	MONTHLY			ESTIMATED		FORECAST
	Sep-23	Oct-23	M/M	Nov-23	Dec-23	Jan-24	Sep-23	Oct-23	M/M	Nov-23	Dec-23	Jan-24
ResCom	335	468	133	585	741	899	266	360	93	465	569	690
Crop Drying	128	215	87	177	127	74	102	165	64	140	98	57
Industrial	84	90	6	103	122	125	67	69	3	81	94	96
Petrochemicals	218	229	10	224	231	230	173	176	2	178	178	177
PDH	88	91	3	95	98	130	70	70	-	75	75	100
Balancing	(53)	69	122	(31)	204	(123)	(42)	53	95	(25)	157	(95)
TOTAL PROPANE	801	1,163	361	1,152	1,522	1,335	636	893	257	914	1,169	1,026
Propylene	328	311	(16)	329	343	352	260	239	(21)	261	263	270
TOTAL DEMAND **	1,129	1,474	345	1,482	1,865	1,687	896	1,132	236	1,176	1,433	1,296
Weekly***	1,009	1,251	242	1,412	1,772		801	961	160	1,121	1,361	
Variance	(120)	(223)	(103)	(69)	(93)		(95)	(171)	(76)	(55)	(72)	

* 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.

*** EIA monthly product supplied through Oct 2023, weekly through the week of December 29, 2023

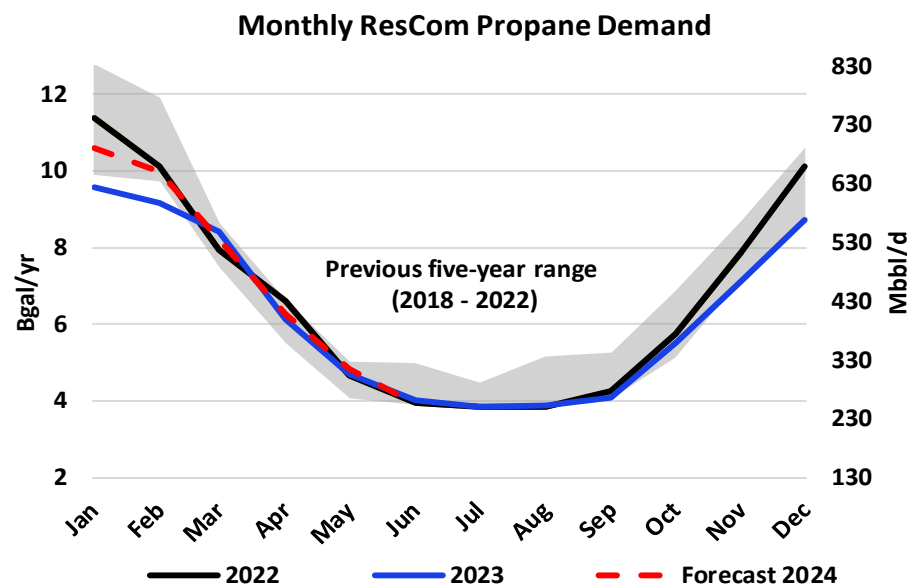
Figure 3.1

RESIDENTIAL & COMMERCIAL

Figure 3.1 shows our current forecast for Residential & Commercial (“ResCom”) demand through June. ResCom demand was higher in December at 569 Mb/d (741 MMgal/m), 104 Mb/d above November but 90 Mb/d less than December 2022. December in the U.S. was one of the warmest on record, with 14% fewer propane population-weighted HDDs than the 5-year average (2018-22) and 22% less than December 2022. For January, our weather forecast data shows 15% more HDDs in the U.S. compared with January 2023 and 7% above the 5-year average (2019-23) for the month. ResCom demand for January is projected at 690 Mb/d, up 121 Mb/d from December and 67 Mb/d higher than January 2023.

PETROCHEMICAL DEMAND REMAINS WEAK

Petchem demand for propane was weak during the month at 178 Mb/d due to poor margins for propane cracking. We expect petchem demand to be relatively flat in January as ethane remains the most economical feedstock. PDH demand increased to 94 Mb/d as one of Enterprise’s units restarted during the month.



Source: RBN Estimate

U.S. PROPANE EXPORTS

Table D: U.S. Propane Exports Monthly and Weekly*						
(Mbbbl/d)	MONTHLY EIA			ESTIMATED		FORECAST
	Sep-23	Oct-23	M/M	Nov-23	Dec-23	Jan-24
Gulf Coast	1,374	1,502	128	1,553	1,517	1,510
East Coast	198	156	(42)	121	157	120
West Coast	31	36	5	23	26	26
Other	4	2	(2)	3	3	4
TOTAL EXPORTS	1,607	1,696	89	1,701	1,704	1,660
Weekly	1,722	1,753	31	1,698	1,826	
Variance	115	57	(58)	(3)	122	

*Monthly data from EIA through October 2023, weekly through the week of December 29, 2023. See [RBN's NGL Voyager Report](#) for additional details on propane exports.

EAST COAST EXPORTS REBOUND

East Coast propane exports (green bars in Figure 4.1) from Energy Transfer's Marcus Hook terminal in Pennsylvania rebounded to 157 Mb/d in December, up 36 Mb/d from November. PADD 1 exports are expected to weaken in January to 120 Mb/d, which is 12 Mb/d higher than January 2023. East Coast

volumes grew at a robust rate in 2023, averaging 153 Mb/d, up 19 Mb/d, or 14%, from 2022. Two propane cargoes were delivered into Blackline's Newington, NH, terminal during the month. They were fourth import cargoes into the region for the winter heating season with a couple more still expected.

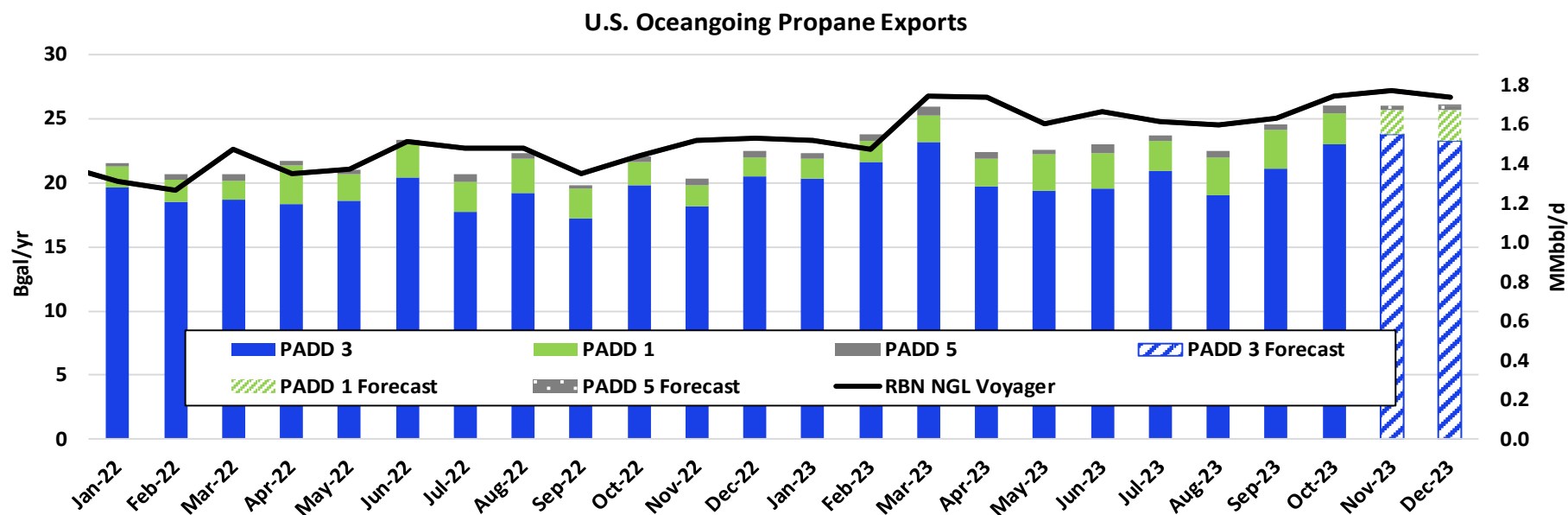
GULF COAST PROPANE EXPORTS REMAIN STRONG

We estimate that Gulf Coast propane exports (blue bars in Figure 4.1) remained robust at 1,517 Mb/d in December, with operating rates close to terminal capacity. We expect volumes in January to stay strong at 1,510 Mb/d. Exports averaged 1,385 Mb/d in 2023, which is up 153 Mb/d, or 12%, from 2022.

WEST COAST EXPORTS SLIGHTLY HIGHER

Propane exports out of the West Coast were slightly higher during the month at 26 Mb/d. We expect January shipments to remain low at 26 Mb/d, which is 5 Mb/d below the 2023 average level. All West Coast exports are shipped to Asia (via the AltaGas Ferndale, WA, terminal) or to Mexico (via railcars/trucks).

Figure 4.1



Source: EIA, RBN Forecast

INTERNATIONAL PROPANE

Figure 4.2

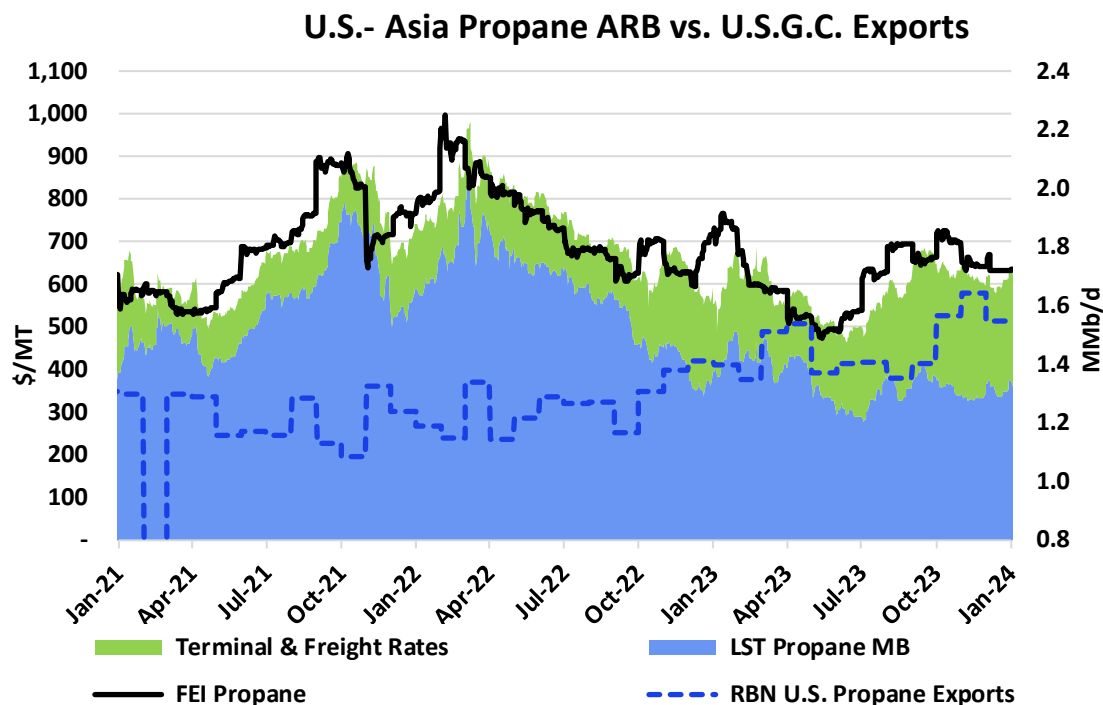
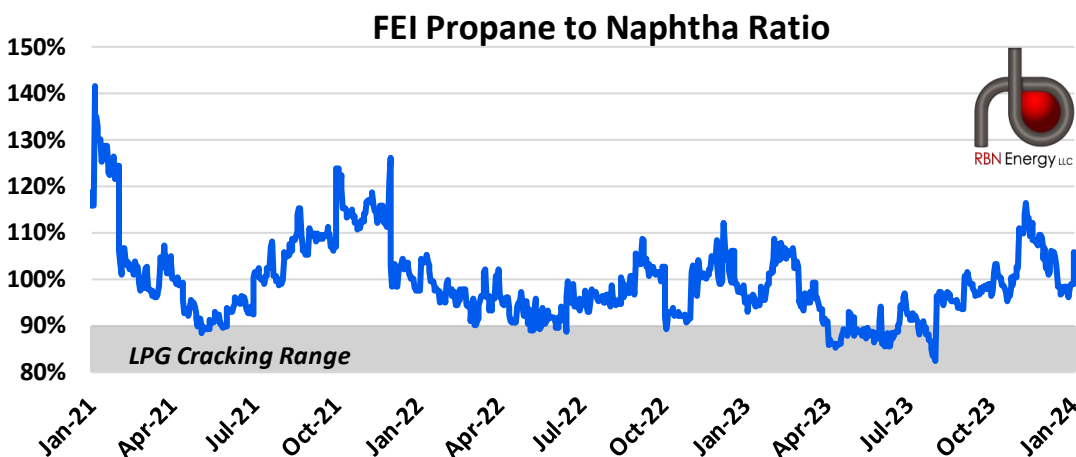


Figure 4.3



U.S.-ASIA PROPANE EXPORT ARB REMAINS OPEN

Saudi Aramco increased contract prices (CP) for January for propane by \$10/MT (1.9 c/gal) to \$620/MT (119 c/gal) while butane was increased to \$630/MT (139 c/gal), up \$10/MT (2.2 c/gal) from the December CP.

The VLGC freight market remained bullish in December. Spot LPG freight rates from the U.S. Gulf Coast to Chiba, Japan, (via Panama Canal) increased by \$2.5/MT (0.5 c/gal) to \$223.5/MT as of January 2, which is 1% above the rate on December 1. Spot terminal fees (resale differentials) moved higher over the period, as values increased by 2 c/gal with an 8 c/gal fee for February loadings as of January 2.

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). Since December 1, the LST propane price at Mont Belvieu increased by \$15/MT to settle at \$358/MT, or 68.9 c/gal, on January 2, while the February FEI propane forward curve fell by \$7/MT, which reduced the spread between U.S. and Asian prices to \$302/MT, or 58.1 c/gal, as of January 2. **Taking into consideration terminal fees and freight costs, the U.S.-Asia propane arb for January-February remained open at minus \$37/MT (minus 7.2 c/gal).**

Figure 4.3 shows the ratio of the Asian FEI propane price to the naphtha price in the same region. As of January 2, the ratio was at 106%, which continues to imply that steam crackers in Asia will tend to favor naphtha feedstock over propane.

U.S. PROPANE PRODUCTION

Figure 5.1

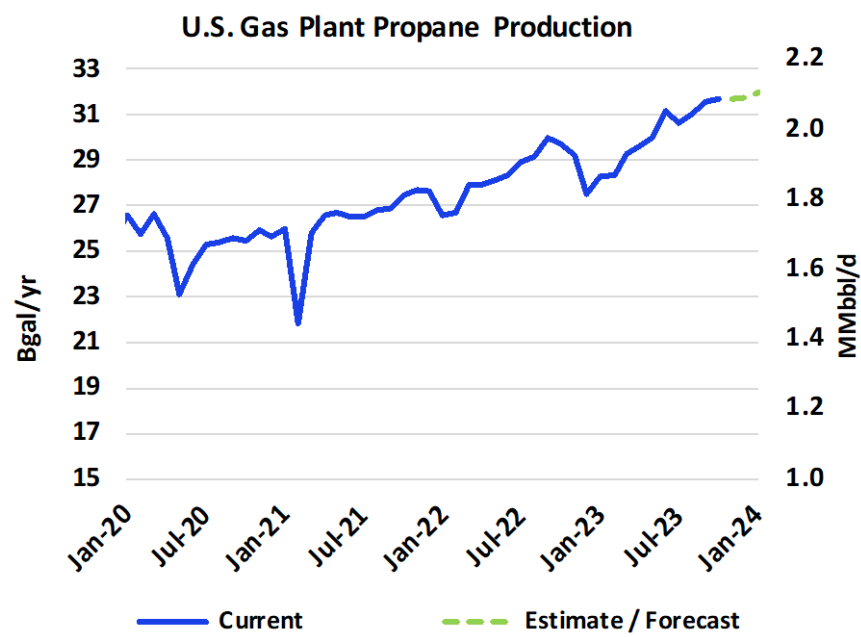


Figure 5.2

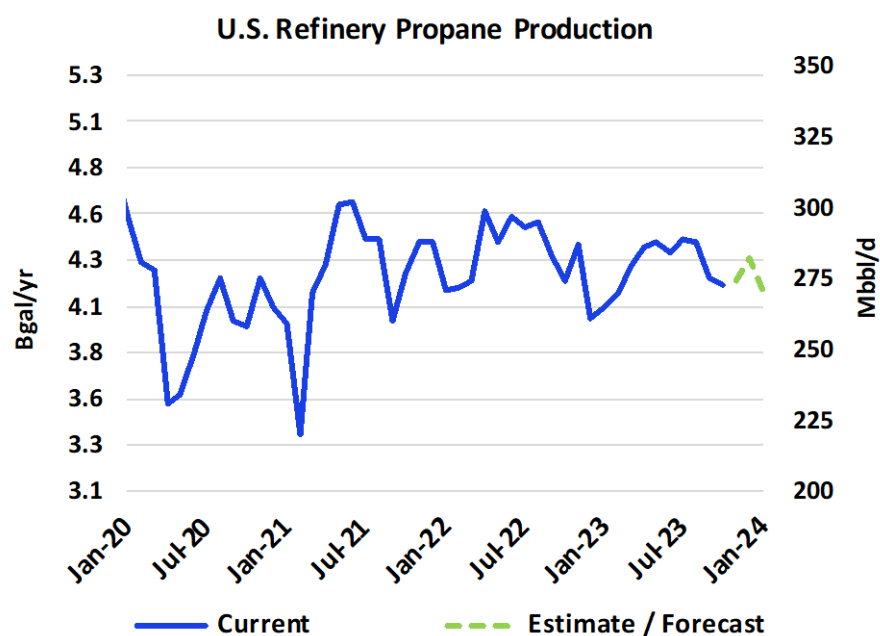


Table E: U.S. Propane Production Monthly and Weekly*						
(Mbb/d)	MONTHLY EIA			ESTIMATED		FORECAST
	Sep-23	Oct-23	M/M	Nov-23	Dec-23	Jan-24
Gas Plant	2,081	2,088	7	2,090	2,092	2,111
Refinery	275	273	(2)	274	282	271
TOTAL PROPANE	2,356	2,361	5	2,365	2,374	2,383
Propylene	244	230	(14)	248	248	245
TOTAL PRODUCTION	2,600	2,591	(9)	2,612	2,622	2,627
Weekly**	2,606	2,603	(3)	2,609	2,630	
Variance	6	12	6	(3)	9	

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

** Monthly production from EIA through October 2023, weekly through the week of December 29, 2023.

OCTOBER GAS PLANT PRODUCTION AT ALL-TIME HIGH

October propane gas plant production, as reported in the EIA Petroleum Supply Monthly on December 29, increased to an all-time high of 2,088 Mb/d, which represents year-on-year growth of 130 Mb/d, or 6.6%, from October 2022. We estimate that gas plant production was relatively flat in December at 2,092 Mb/d. For 2023, we project that gas plant volumes averaged 2,006 Mb/d, an increase of 135 Mb/d, or 7.2%, from the 2022 average. Based upon our production forecast model we estimate 2024 volumes at 130-140 Mb/d above 2023. With Gulf Coast LPG export capacity already tight, increasing propane and butane production will need to find outlets other than exports to balance the market until the terminal expansion projects come online in mid-2025.

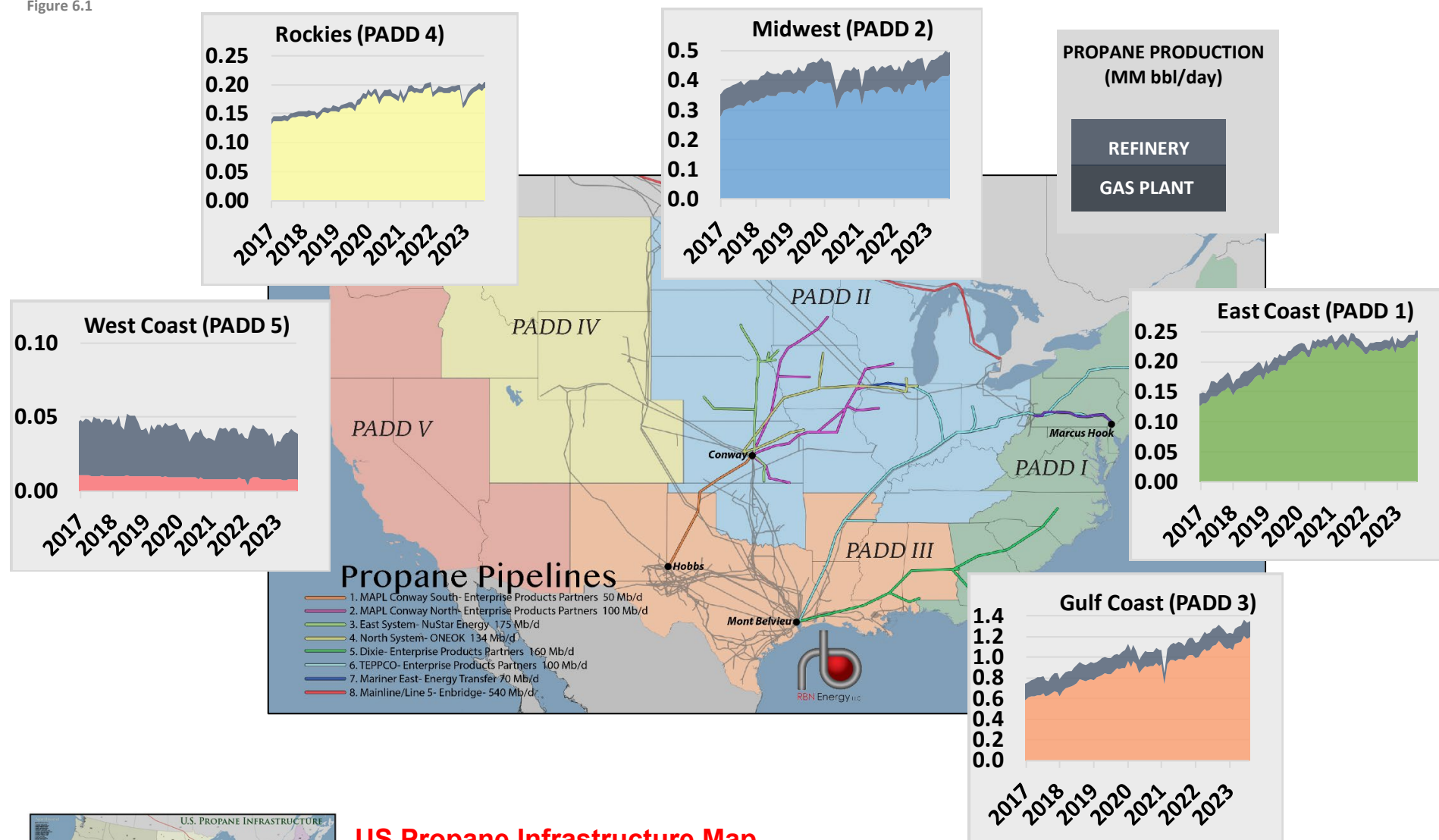
REFINERY PRODUCTION SLIGHTLY STRONGER

Refinery propane production was modestly stronger in December with volumes up by 8 Mb/d to 282 Mb/d as capacity utilization rose by 3.8 percentage points to 92%. We estimate that production in January will decline to 271 Mb/d as refinery operating rates fall to ~88%. For 2023, we forecast refinery propane production averaged 279 Mb/d for the year, down 4 Mb/d from 2022, primarily due to slightly lower capacity utilization.

Source: EIA, RBN Forecast

U.S. PROPANE INFRASTRUCTURE MAP

Figure 6.1



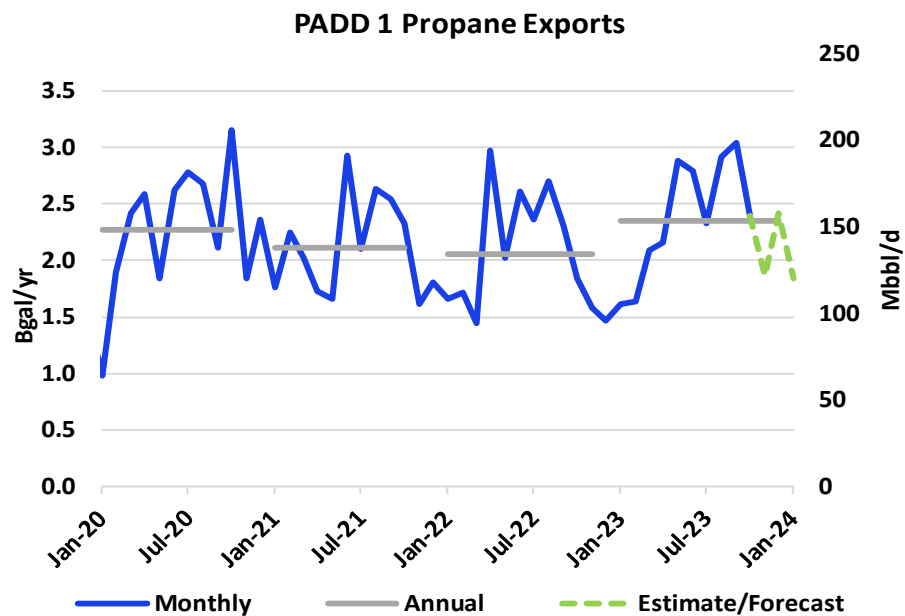
US Propane Infrastructure Map

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		
	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Production	318	329	321	332	340	319	343	252	253	255	255	261	262	263
Gas Plants	301	315	303	312	321	302	324	239	242	241	240	247	248	249
Refinery	16	14	17	19	19	18	19	13	11	14	15	14	14	15
Imports	24	27	24	46	53	75	44	19	21	19	35	41	62	34
Net Inter-PADD Transfers	223	279	296	326	271	242	243	177	214	235	251	208	198	187
TOTAL SUPPLY	564	635	641	704	664	636	630	448	488	509	541	510	522	484
Demand (Prod. Supplied)	315	408	455	581	591	559	414	250	313	361	446	454	459	318
Exports	249	203	153	205	156	152	228	198	156	121	157	120	125	175
Stock Change	(1)	25	34	(81)	(83)	(75)	(12)	(1)	19	27	(62)	(64)	(62)	(9)
TOTAL DISPOSITION	563	635	641	704	664	636	630	447	488	509	541	510	522	484
TOTAL INVENTORY	356	381	415	333	250	175	163	8,469	9,070	9,870	7,933	5,953	4,161	3,870

Figure 7.1



Source: EIA, RBN Forecast

INSIGHTS & ANALYSIS

PADD 1 (East Coast) had an above-average draw in stocks of 2.0 MMbbl for December, compared to the 1.8-MMbbl decline last year and the 5-year average drop of 1.2 MMbbl. This puts PADD 1 inventory at 7.9 MMbbl (333 MMgal), which is 1.1 MMbbl (16%) above December 2022 and 0.9 MMbbl (13.5%) higher than the 5-year average. Exports were stronger at 157 Mb/d, up 36 Mb/d from November and 4 Mb/d higher than the 2023 average. Exports are projected to average 153 Mb/d for 2023, an increase of 19 Mb/d from 2022. Gas plant production in the Northeast was little changed at 240 Mb/d.

PADD 1 OUTLOOK

Our propane model projects East Coast inventories will decline by 2 MMbbl in January to 5.9 MMbbl (250 MMgal), leaving stocks 0.4 MMbbl below last year and 0.3 Mbbbl less than the 5-year average. As shown in Figure 7.1, East Coast exports are expected to seasonally weaken in January to support local demand to 120 Mb/d, which is 33 Mb/d below the 2023 average but 12 Mb/d higher than January 2023.

PADD 2: PROPANE SUPPLY & DEMAND

Table G:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Production	630	647	628	652	646	607	650	500	497	499	501	496	498	499
Gas Plants	539	553	538	555	555	521	559	428	425	427	426	426	428	429
Refinery	91	94	91	98	91	86	91	72	72	72	75	70	70	70
Imports	35	40	46	41	40	43	38	28	31	36	32	31	36	30
Net Inter-PADD Transfers	(433)	(509)	(466)	(464)	(370)	(455)	(527)	(344)	(391)	(370)	(357)	(284)	(374)	(405)
TOTAL SUPPLY	232	178	208	229	315	195	161	184	137	165	176	242	160	124
Demand (Prod. Supplied)	142	214	288	373	460	403	249	113	164	228	286	353	331	192
Exports	5	3	4	4	5	5	7	4	2	3	3	4	4	5
Stock Change	84	(39)	(84)	(148)	(149)	(212)	(95)	67	(30)	(67)	(114)	(114)	(174)	(73)
TOTAL DISPOSITION	232	177	208	229	315	195	161	184	136	165	176	242	160	124
TOTAL INVENTORY	1,177	1,139	1,055	907	758	545	450	28,026	27,108	25,109	21,585	18,038	12,982	10,722

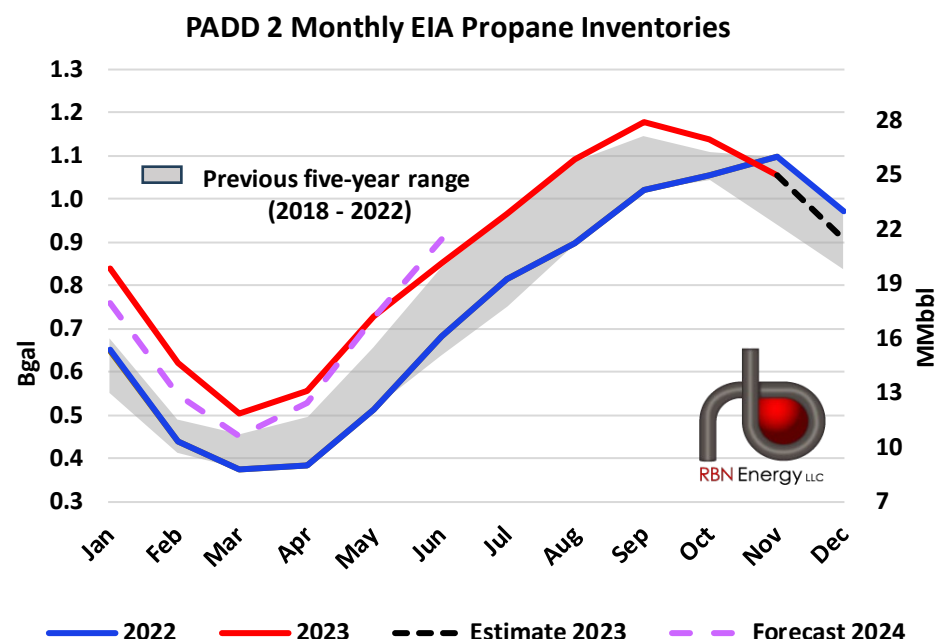
INSIGHTS & ANALYSIS

PADD 2 (Midwest) inventories fell by 3.5 MMbbl during December, which was slightly above the 3-MMbbl decline last year and the 5-year average draw of 3.3 MMbbl, leaving stocks ending at 21.6 MMbbl (907 MMgal). With the big correction to the EIA weekly inventories, the Midwest market is now in a slightly worse supply position compared to last year with 1.5 MMbbl less in storage. Total production was basically flat in December at 501 Mb/d. Imports were marginally lower at 32 Mb/d, which was 18 Mb/d less than last December and 13 Mb/d below the 2022 average. Canadian imports into the Midwest are projected to average 33 Mb/d in 2023, down 12 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).

PADD 2 OUTLOOK

Midwest inventories are forecast to draw by 3.1 MMbbl in January compared to a 5-year average (2019-23) decline of 4.6 MMbbl, bringing ending inventories to 18 MMbbl (758 MMgal), 1.9 MMbbl lower than last year but 1.6 MMbbl above the 5-year average (2019-23).

Figure 7.2

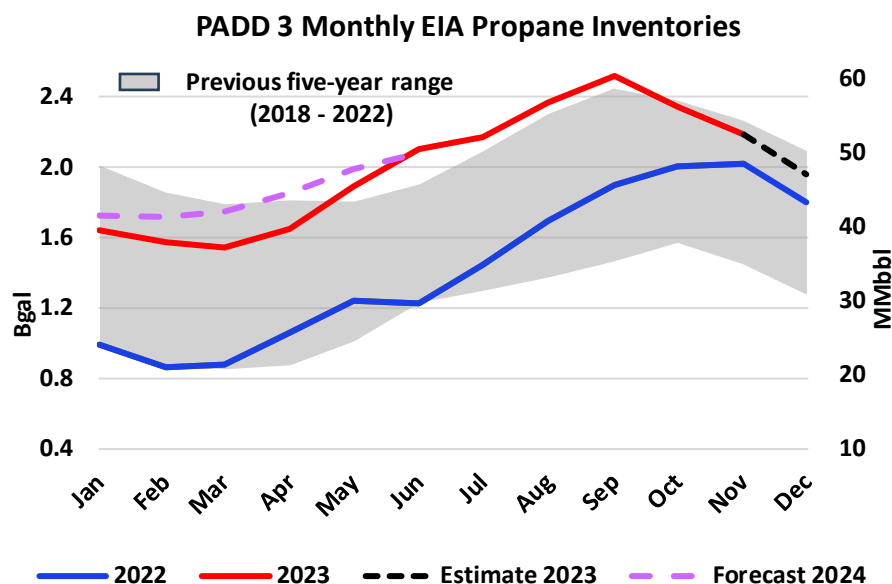


Source: EIA, RBN Forecast

PADD 3: PROPANE SUPPLY & DEMAND

Table H:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Production	1,719	1,786	1,731	1,797	1,803	1,693	1,817	1,364	1,372	1,374	1,380	1,385	1,390	1,395
Gas Plants	1,528	1,583	1,539	1,594	1,608	1,511	1,621	1,213	1,216	1,221	1,224	1,235	1,240	1,245
Refinery	190	203	192	203	195	182	196	151	156	153	156	150	150	150
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Inter-PADD Transfers	407	434	337	335	286	381	482	323	333	268	258	219	313	370
TOTAL SUPPLY	2,126	2,220	2,068	2,132	2,089	2,074	2,299	1,687	1,705	1,642	1,638	1,604	1,703	1,766
Demand (Prod. Supplied)	243	435	276	381	356	244	303	193	334	219	293	274	200	233
Exports	1,731	1,956	1,957	1,976	1,966	1,839	1,966	1,374	1,502	1,553	1,517	1,510	1,510	1,510
Stock Change	152	(169)	(165)	(225)	(233)	(9)	30	121	(130)	(131)	(173)	(179)	(7)	23
TOTAL DISPOSITION	2,127	2,221	2,068	2,132	2,089	2,074	2,299	1,688	1,706	1,642	1,638	1,604	1,703	1,766
TOTAL INVENTORY	2,515	2,346	2,181	1,957	1,723	1,714	1,744	59,886	55,855	51,934	46,584	41,030	40,815	41,528

Figure 7.3



Source: EIA, RBN Forecast

INSIGHTS & ANALYSIS

PADD 3 had a stock draw of 5.4 MMbbl for the month, which was in line with the 5.2 MMbbl decline in December 2022 and the 6.1 MMbbl average drop for the month. This dropped Gulf Coast inventories to 46.6 MMbbl (2 Bgal) at month's end, 3.8 MMbbl (8.8%) higher than last year and 7.8 MMbbl, or 20%, above the 5-year average. Propane exports from the Gulf Coast remained strong at 1,517 Mb/d, down 36 Mb/d from November but 181 Mb/d (14%) higher than in December 2022. PADD 3 gas plant production increased to 1,224 Mb/d in December, up 3 Mb/d from November and 8 Mb/d above the previous record high set in October 2023.

PADD 3 OUTLOOK

January inventories are forecast to fall by 5.6 MMbbl, compared to the 3.7 MMbbl draw last year for the month and the 5-year average decline of 5.7 MMbbl. That would leave January ending stocks at 41 MMbbl (1.7 Bgal), which is 1.9 MMbbl (4.9%) more than last year and 7.4 MMbbl (22%) above the 5-year average (2019-23). Gulf Coast propane production is expected to increase in January to 1,235 Mb/d, which is 150 Mb/d, or 14%, above January 2023.

PADD 4: PROPANE SUPPLY & DEMAND

Table I:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Production	255	268	255	263	265	248	265	202	206	203	202	204	204	204
Gas Plants	244	258	245	253	255	239	255	194	198	195	195	196	196	196
Refinery	10	10	10	10	10	9	10	8	8	8	8	8	8	8
Imports	11	17	14	17	16	16	13	9	13	11	13	12	13	10
Net Inter-PADD Transfers	(215)	(229)	(210)	(208)	(206)	(182)	(216)	(171)	(176)	(166)	(159)	(158)	(149)	(166)
TOTAL SUPPLY	50	56	60	72	75	82	62	40	43	47	56	58	67	48
Demand (Prod. Supplied)	47	53	55	85	87	86	79	37	41	44	65	67	71	61
Exports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock Change	4	3	5	(12)	(12)	(5)	(17)	3	2	4	(9)	(9)	(4)	(13)
TOTAL DISPOSITION	50	56	60	72	75	82	62	40	43	47	56	58	67	48
TOTAL INVENTORY	132	134	138	126	114	109	92	3,139	3,186	3,294	3,006	2,713	2,605	2,189

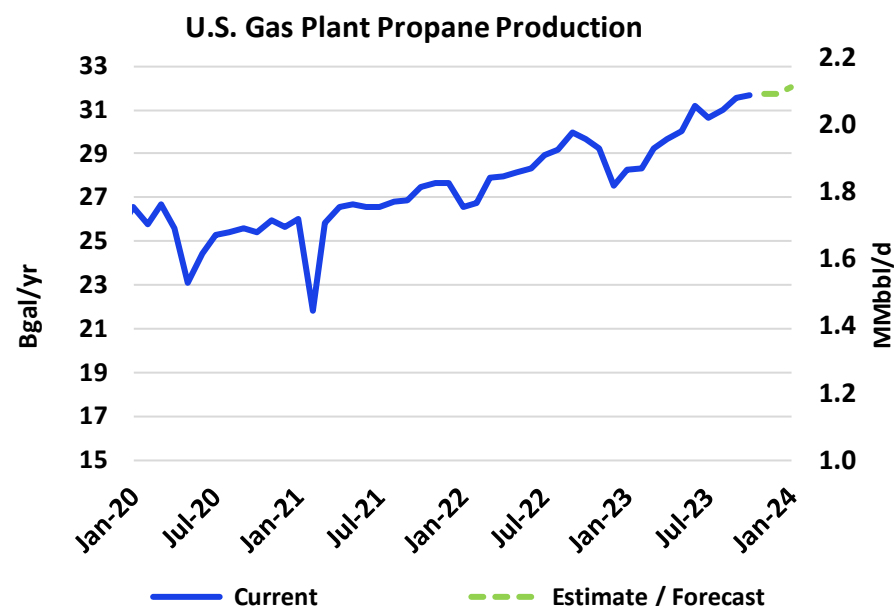
Figure 7.4

INSIGHTS & ANALYSIS

PADD 4 (Rocky Mountain) stocks declined by 288 Mbbl in December to 3 MMbbl (126 MMgal), which is 0.6 MMbbl (26%) higher than last year and 0.8 MMbbl (35%) above the 5-year average. Gas plant production was unchanged in December at 195 Mb/d (see Figure 7.4). Refinery production and imports were also little changed at 8 Mb/d and 13 Mb/d, respectively.

PADD 4 OUTLOOK

PADD 4 inventories are projected to draw by 293 Mbbl during January, leaving stocks at 2.7 MMbbl (114 MMgal), which is 0.7 Mbbl (33%) higher than January 2023 and 0.8 MMbbl (39%) above the 5-year average (2019-2023). Rockies gas plant production is expected to be little changed in January at 196 Mb/d, up 1 Mb/d from December and 8 Mb/d above the 2023 average rate.

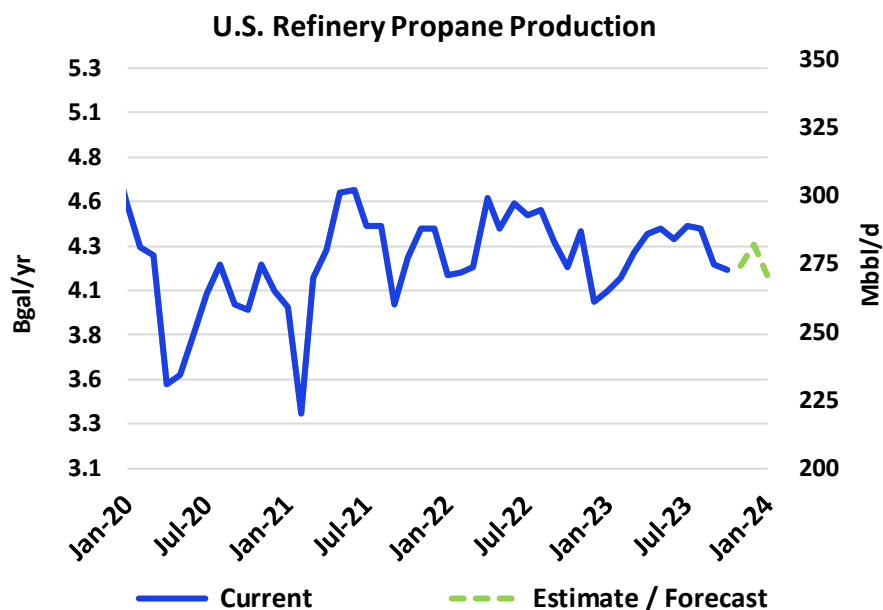


Source: EIA, RBN Forecast

PADD 5: PROPANE SUPPLY & DEMAND

Table J:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Production	48	43	44	46	48	45	48	38	33	35	36	37	37	37
Gas Plants	9	9	9	9	10	9	9	7	7	7	7	7	7	7
Refinery	39	34	35	37	38	36	38	31	26	28	29	29	29	29
Imports	37	39	35	42	45	42	44	29	30	28	32	35	35	34
Net Inter-PADD Transfers	18	26	25	28	20	14	18	14	20	20	21	15	12	14
TOTAL SUPPLY	102	108	105	116	112	101	110	81	83	83	89	86	83	84
Demand (Prod. Supplied)	54	53	79	103	102	76	73	43	41	63	79	78	63	56
Exports	39	47	29	34	34	41	51	31	36	23	26	26	34	40
Stock Change	9	7	(3)	(20)	(23)	(16)	(15)	7	5	(3)	(16)	(18)	(13)	(11)
TOTAL DISPOSITION	102	107	105	116	112	101	110	81	82	83	89	86	83	84
TOTAL INVENTORY	111	117	114	94	70	55	40	2,646	2,794	2,717	2,231	1,677	1,298	951

Figure 7.5



Source: EIA, RBN Forecast

INSIGHTS & ANALYSIS

PADD 5 (West Coast) inventories declined by 486 Mbbl in December, ending at 2.2 MMbbl (94 MMgal). This leaves stocks 751 Mbbl (51%) higher than in December 2022 and 557 Mbbl (33%) above the 5-year average (2018-22). Refinery production was slightly higher at 29 Mb/d as capacity utilization increased to ~85%. West Coast exports were modestly stronger at 26 Mb/d and slightly below imports, which increased to 32 Mb/d. For 2023, PADD 5 exports are estimated to average 31 Mb/d, up 4 Mb/d from 2022.

PADD 5 OUTLOOK

Our propane model projects West Coast inventories to decline by 524 Mbbl in January to 1.7 MMbbl (70 MMgal), leaving stocks 524 Mbbl (45%) above January 2023 and 476 Mbbl (40%) above the 5-year average (2019-23). As shown in Figure 7.5, refinery production in PADD 5 is expected to be flat at 29 Mb/d in January as capacity utilization remains around 85%. Imports are projected to be slightly stronger at 35 Mb/d, which is 5 Mb/d above the 2023 average. January exports for the region are expected to remain flat at 26 Mb/d, up 2 Mb/d from last year but 5 Mb/d below the 2023 average rate.

KEY ENERGY PRICES

Table K:		Prices									
Product	Units	Current	Prior Week			Prior Month			Prior Year		
		1-Jan-24	25-Dec-23	W/W	W/W %	1-Dec-23	M/M	M/M %	1-Jan-23	Y/Y	Y/Y %
Brent Crude	\$/bbl	78.4	79.1	(0.7)	-0.9%	78.9	(0.5)	-0.6%	82.3	(3.9)	-4.7%
WTI Cushing Crude	\$/bbl	71.7	73.6	(1.9)	-2.6%	74.1	(2.4)	-3.3%	80.3	(8.6)	-10.7%
Henry Hub Natural Gas	\$/MMbtu	2.51	2.61	(0.10)	-3.7%	2.81	(0.30)	-10.7%	4.48	(1.96)	-43.8%
Propane											
Mont Belvieu Non-TET	c/gal	73.7	67.5	6.2	9.2%	71.8	1.9	2.6%	74.3	(0.6)	-0.9%
Mont Belvieu TET	c/gal	71.3	66.7	4.7	7.0%	70.5	0.8	1.2%	75.7	(4.4)	-5.8%
Conway	c/gal	71.9	63.8	8.1	12.7%	67.4	4.5	6.6%	77.3	(5.4)	-7.0%
Edmonton	c/gal	51.5	43.3	8.2	18.9%	50.0	1.5	3.0%	65.5	(14.0)	-21.4%
Sarnia	c/gal	91.1	87.0	4.1	4.7%	83.0	8.1	9.8%	98.0	(6.9)	-7.0%
European (ARA)	\$/MT	500.5	498.9	1.7	0.3%	493.7	6.8	1.4%	557.9	(57.4)	-10.3%
Saudi CP	\$/MT	629.8	612.6	17.2	2.8%	590.1	39.8	6.7%	586.8	43.0	7.3%

Figure 8.1

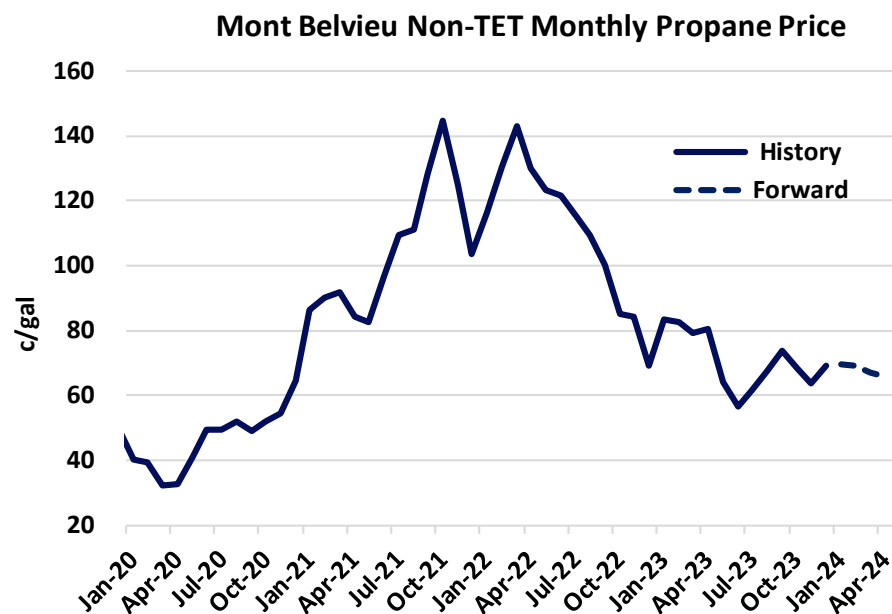
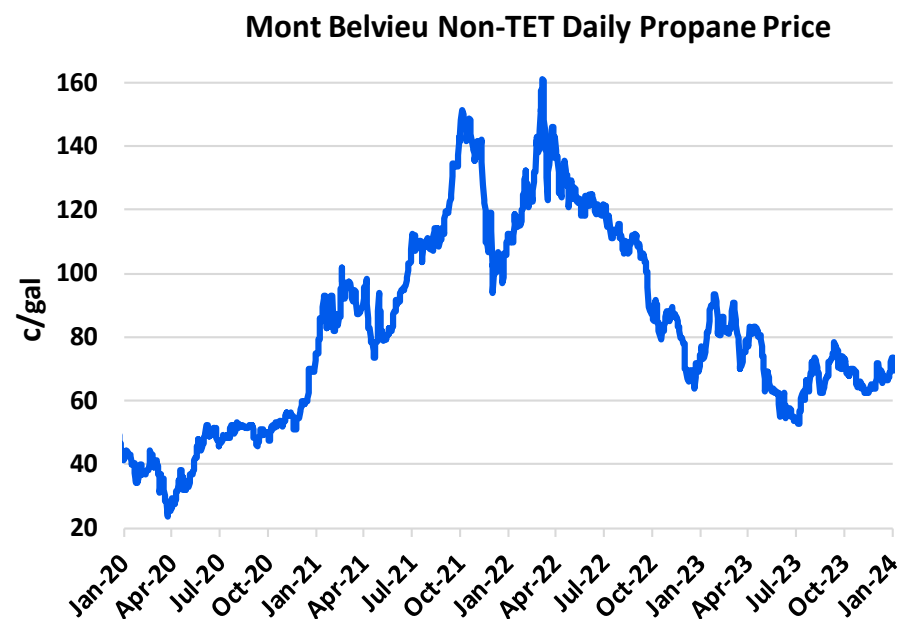


Figure 8.2



MONTHLY PROPANE PRICE TRENDS

Figure 8.3

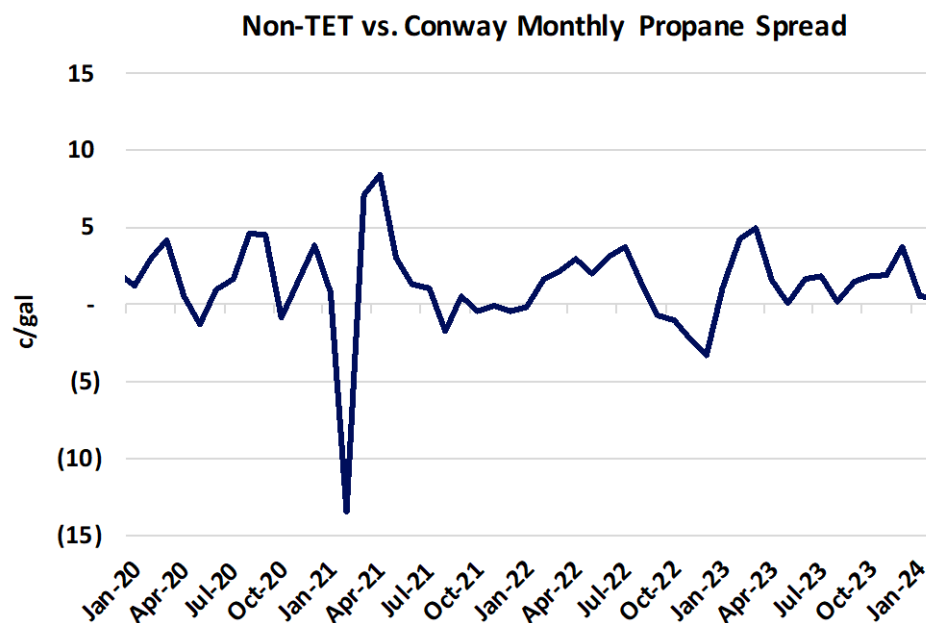


Figure 8.4

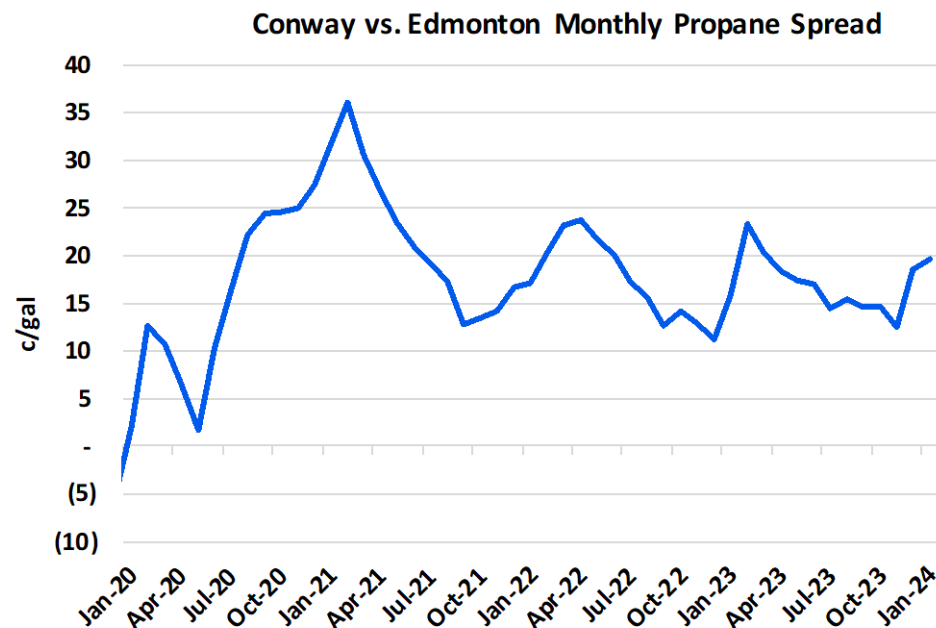


Figure 8.5

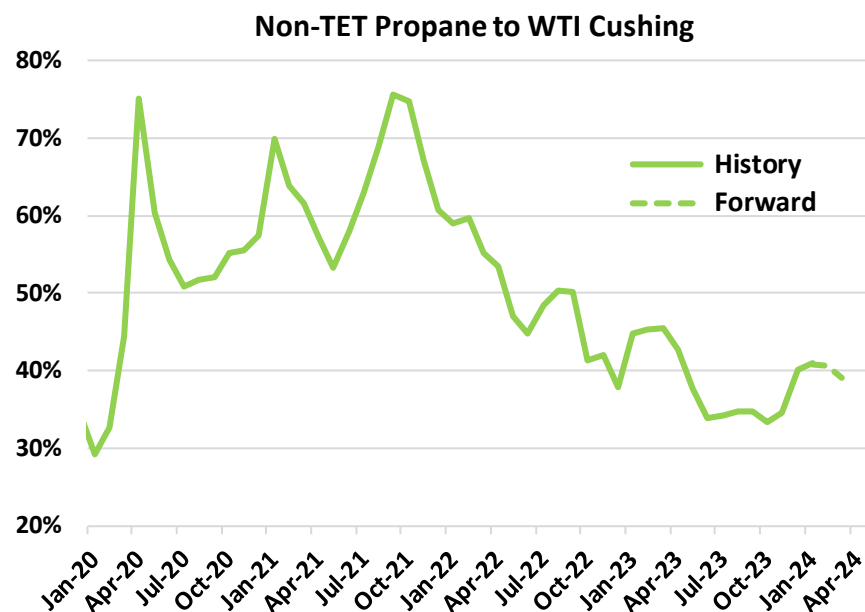


Table L: MB TET Propane / WTI Cushing					
%	2020	2021	2022	2023	Y/Y %
Oct	55.0%	74.9%	41.5%	33.6%	-19.1%
Nov	55.7%	67.1%	42.5%	34.8%	-18.3%
Dec	57.3%	61.0%	38.2%	39.4%	3.0%
Q1	36.6%	65.8%	58.3%	45.0%	-22.9%
Q2	60.5%	55.5%	48.8%	38.4%	-21.3%
Q3	50.6%	69.2%	49.5%	35.1%	-29.2%
Q4	56.0%	67.7%	40.8%	35.9%	-11.8%
Year	51.0%	64.6%	49.3%	38.6%	-21.8%

INTERNATIONAL PROPANE PRICE SPREADS

Figure 9.1

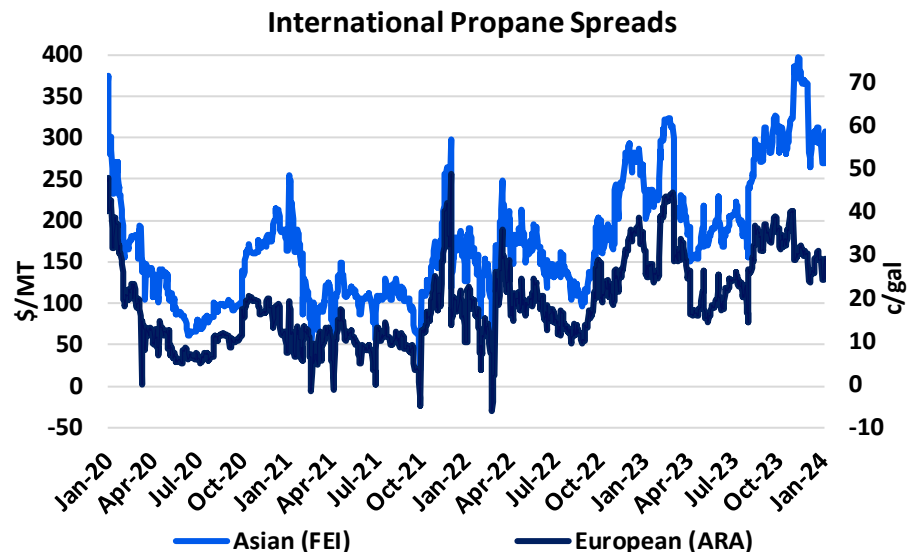


Figure 9.2

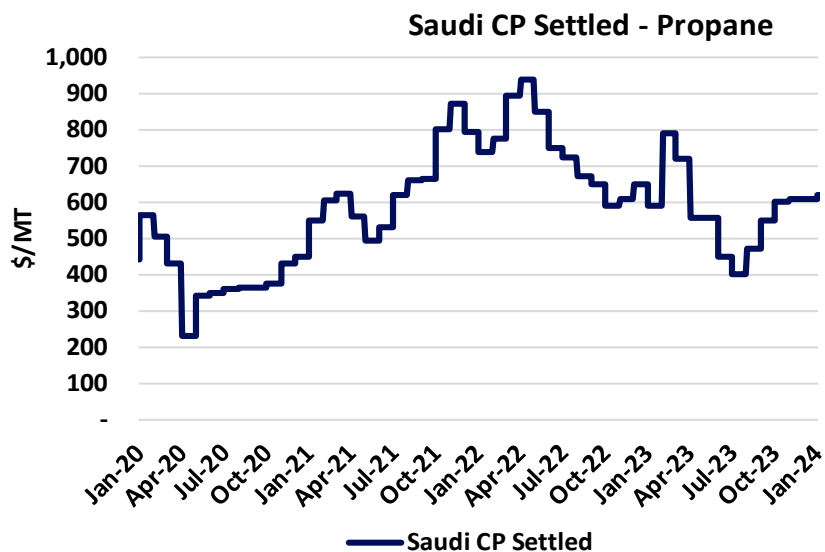


Table M: Asian FEI / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Oct	157.2	130.1	177.8	301.6	69.6%
Nov	173.5	203.9	252.3	374.6	48.5%
Dec	194.3	158.1	268.2	292.8	9.2%
Q1	192.9	129.5	151.5	247.9	63.6%
Q2	97.6	106.1	163.8	181.5	10.8%
Q3	91.0	101.1	134.0	255.7	90.8%
Q4	175.0	163.6	232.5	322.4	38.7%
Year	139.1	125.1	170.6	252.1	47.8%

Table N: European ARA / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Oct	100.2	89.0	114.4	186.0	62.6%
Nov	94.1	155.8	146.3	160.7	9.9%
Dec	74.2	90.5	183.1	143.6	-21.5%
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	156.8	97.8%
Q4	89.5	111.3	147.9	163.5	10.5%
Year	76.4	66.0	104.1	148.3	42.4%

Table O: Saudi CP / MB TET Spread					
\$/MT	2020	2021	2022	2023	Y/Y %
Oct	146.4	94.6	136.7	295.2	116.0%
Nov	160.4	170.0	186.3	318.2	70.8%
Dec	143.5	169.1	212.5	255.2	20.1%
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	182.4	99.1%
Q4	150.0	144.3	178.4	289.2	62.1%
Year	137.6	103.7	135.4	208.0	53.6%

U.S. PROPANE SUPPLY & DEMAND BALANCE DETAIL

Table P:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Gas Processing	2,622	2,719	2,634	2,724	2,749	2,581	2,769	2,081	2,088	2,090	2,092	2,111	2,119	2,127
Refinery Propane	347	355	346	367	353	331	353	275	273	274	282	271	271	272
Imports	107	124	119	146	154	176	139	85	95	95	112	118	145	107
TOTAL SUPPLY	3,076	3,198	3,098	3,237	3,256	3,088	3,262	2,441	2,456	2,459	2,486	2,501	2,535	2,505
Product Supplied	801	1,163	1,152	1,522	1,596	1,368	1,119	636	893	914	1,169	1,226	1,123	859
ResCom	335	468	585	741	899	794	697	266	360	465	569	690	652	535
Crop Drying	128	215	177	127	74	56	39	102	165	140	98	57	46	30
Industrial	84	90	103	122	125	109	101	67	69	81	94	96	89	77
Petrochemicals	218	229	224	231	230	217	235	173	176	178	178	177	178	181
PDH	88	91	95	98	130	122	130	70	70	75	75	100	100	100
Balancing	(53)	69	(31)	204	137	71	(83)	(42)	53	(25)	157	105	59	(64)
Exports	2,025	2,208	2,143	2,218	2,161	2,037	2,252	1,607	1,696	1,701	1,704	1,660	1,673	1,730
Stock Change	248	(174)	(214)	(487)	(501)	(317)	(109)	197	(134)	(170)	(374)	(385)	(260)	(84)
TOTAL DISPOSITION	3,074	3,196	3,082	3,254	3,256	3,088	3,262	2,440	2,455	2,446	2,499	2,501	2,535	2,505
TOTAL INVENTORY	4,291	4,117	3,903	3,416	2,915	2,598	2,489	102,166	98,013	92,924	81,338	69,410	61,860	59,260
Last Year Inventory	3,443	3,642	3,682	3,219	2,882	2,545	2,344	81,980	86,724	87,672	76,642	68,612	60,588	55,812
Stock M/M Δ	248	(174)	(214)	(487)	(501)	(317)	(109)	5,910	(4,154)	(5,090)	(11,585)	(11,928)	(7,550)	(2,600)
Last Year Stock M/M Δ	384	201	39	(464)	(335)	(348)	(201)	9,150	4,774	930	(11,036)	(7,967)	(8,294)	(4,774)

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

PADD AVERAGE HEATING DEGREE DAYS (HDDs)

Figure 10.1

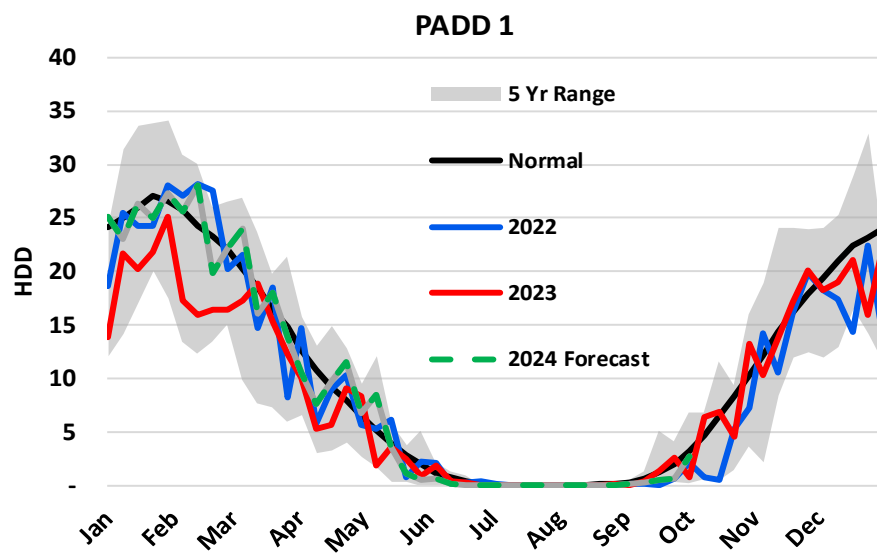


Figure 10.2

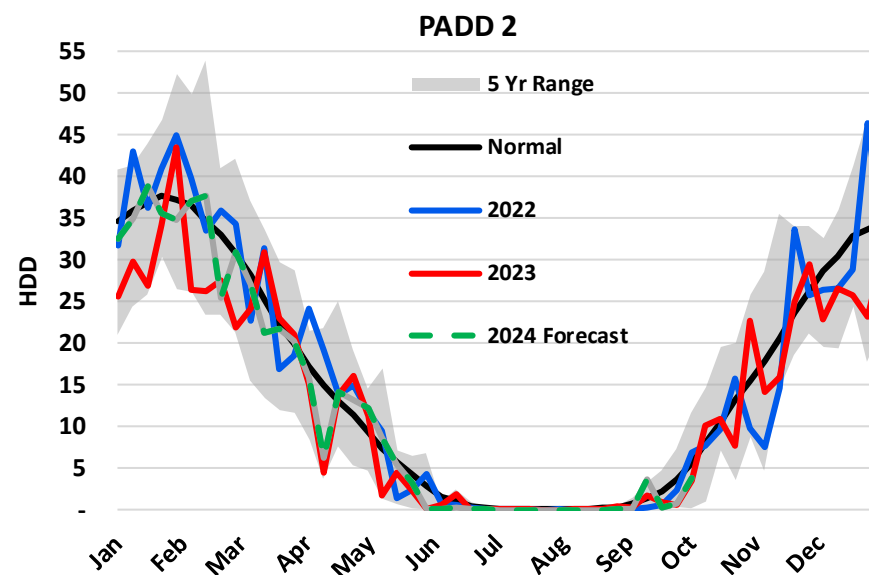


Figure 10.3

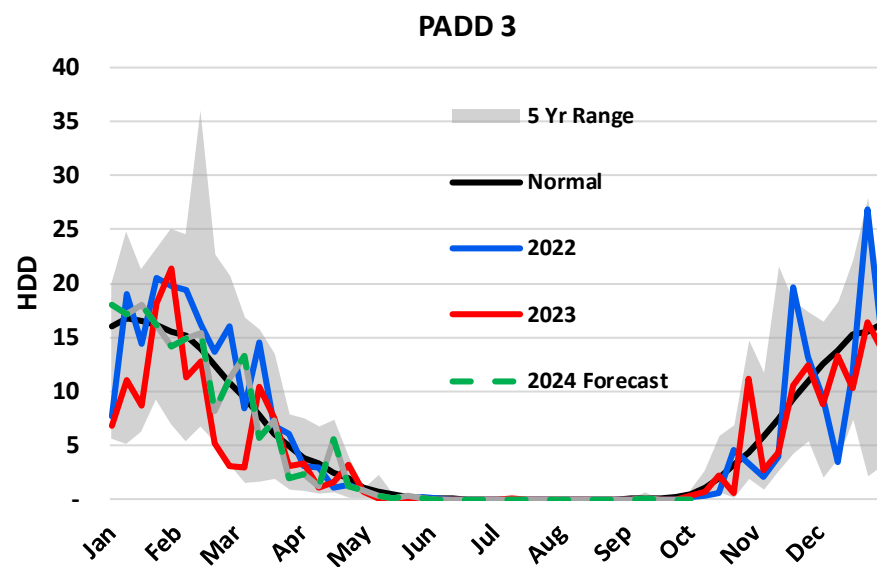


Figure 10.4

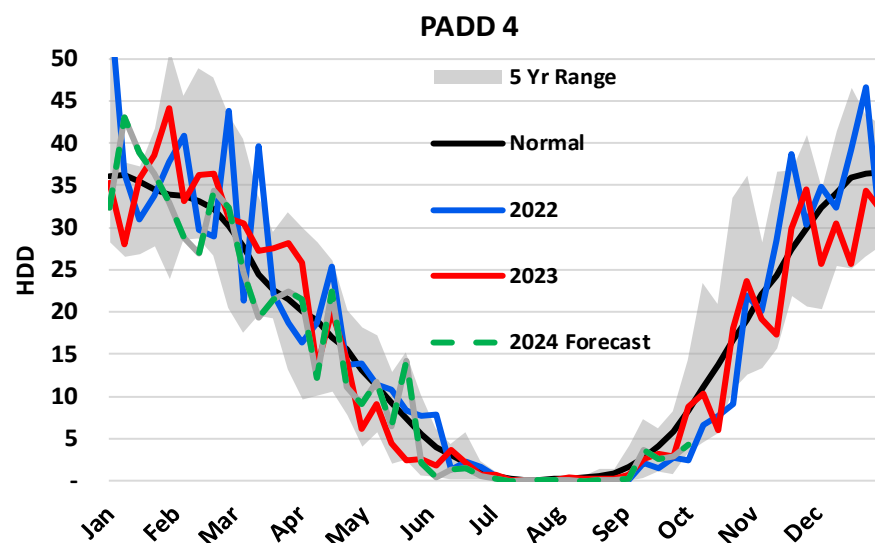
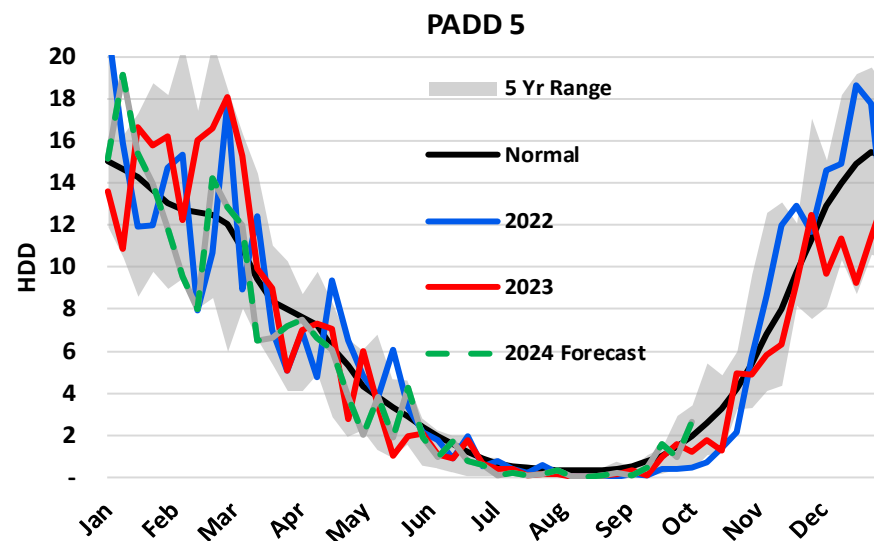


Figure 10.5



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