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		
	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Production	2,755	2,612	2,431	2,720	2,662	2,773	2,707	2,116	2,006	2,068	2,089	2,113	2,130	2,149
Gas Plants	2,371	2,262	2,106	2,352	2,299	2,397	2,340	1,821	1,737	1,791	1,807	1,824	1,841	1,857
Refinery	384	350	326	367	363	376	367	295	269	277	282	288	289	292
Imports	204	214	153	163	109	92	81	157	164	130	125	87	71	65
TOTAL SUPPLY	2,959	2,825	2,584	2,883	2,771	2,865	2,789	2,273	2,170	2,197	2,214	2,199	2,200	2,213
Demand (Prod. Supplied	1,516	1,719	1,590	1,191	734	743	616	1,164	1,320	1,352	915	582	571	489
Exports	1,777	1,747	1,521	1,853	1,822	1,880	1,823	1,365	1,342	1,293	1,423	1,446	1,444	1,447
Stock Change	(335)	(642)	(526)	(121)	215	242	350	(257)	(493)	(447)	(93)	171	186	278
TOTAL DISPOSITION	2,958	2,824	2,584	2,923	2,771	2,865	2,789	2,272	2,169	2,198	2,245	2,199	2,200	2,213
TOTAL INVENTORY*	2.6	2.0	1.5	1.4	1.6	1.8	2.2	62.1	48.4	35.8	33.0	38.1	43.8	52.2

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

MONTHLY HIGHLIGHTS

- The propane market continued to be highly volatile in March, with Mont Belvieu prices consistently trading with crude oil at around 55% - 60% of WTI.
- Total U.S. propane inventories built for the third consecutive week as of April 1, 2022, effectively marking the end of the winter withdrawal season. March ending inventory levels are estimated at 33 million barrels, the lowest level since the Polar Vortex in 2014.
- EIA reported monthly propane production from gas processing once again came in below our expectations for January, falling sharply by 84 Mb/d. Gas plant production has been relatively flat since October, which we believe is at least partly due to weather related curtailments.
- Effective January 2022, the EIA revised its monthly NGL inventory calculation methodology to include end-users with at least 50 Mbbl of storage capacity. The change will result in an upward revision to propane inventories of about 5% which will be applied retroactively to 2021 data later this year.

MARKET OVERVIEW

The 2021 - 2022 winter propane season was a real dozy. Historically low inventory levels, strong export demand and lackluster production growth had many ready to hit the “Armageddon” panic button in early October. So, given all these challenges why did the winter heating season turn out to be relatively uneventful? Part of the reason was weak crop drying demand and warm weather in October - December. Also, when we finally did get colder than normal winter weather in January and February, it was not a sustained period of polar-vortex like weather. There was enough relief between the periodic artic blasts for supply chains to maintain generally adequate flows. But much of the credit goes to propane marketers that recognized the potentially serious inventory situation in early on and proactively filled secondary and tertiary storage heading into winter.

Now as we enter the propane injection season with inventories still well below average, the next big question in front of the market is what will happen to the rate of storage fill. Will inventories continue to scrape along the five-year minimum level like last year, or will we see stocks replenished back to more ‘average’ inventory levels? We will monitor these statistics closely in the months to come.

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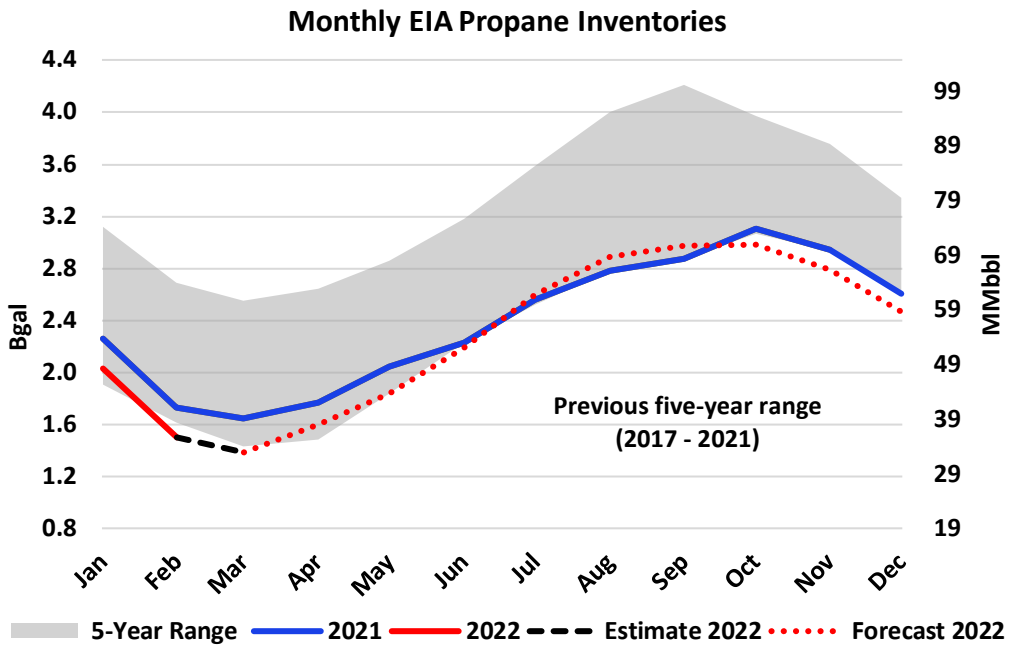
U.S. PROPANE INVENTORIES

Table B:	MM gal						M bbl					
	MONTHLY EIA			ESTIMATED		FORECAST	MONTHLY EIA			ESTIMATED		FORECAST
	Dec-21	Jan-22	M/M	Feb-22	Mar-22	Apr-22	Dec-21	Jan-22	M/M	Feb-22	Mar-22	Apr-22
PADD 1 (East Coast)	316	227	(89)	145	158	193	7,521	5,412	(2,109)	3,462	3,756	4,590
PADD 2 (Midwest)	900	650	(251)	440	342	399	21,438	15,469	(5,969)	10,468	8,144	9,505
PADD 3 (Gulf Coast)	1,202	1,006	(196)	798	791	890	28,615	23,948	(4,667)	18,989	18,827	21,196
PADD 4 (Rocky Mountains)	119	103	(15)	77	61	74	2,833	2,464	(369)	1,831	1,449	1,754
PADD 5 (West Coast)	70	45	(25)	46	33	44	1,670	1,064	(606)	1,085	787	1,045
TOTAL PROPANE	2,607	2,031	(576)	1,505	1,384	1,600	62,077	48,357	(13,720)	35,835	32,963	38,089
Propylene	59	51	(8)	55	59	61	1,397	1,208	(189)	1,320	1,413	1,443
TOTAL INVENTORIES	2,666	2,082	(584)	1,561	1,444	1,660	63,474	49,565	(13,909)	37,155	34,376	39,532

Figure 1.1



Source: EIA

ANALYSIS & INSIGHTS

As shown in Table B, March estimated inventories fell by 8% to 33.0 MMbbl (1.4 Bgal). March inventories are now 1.1 Mbbl below the 5-year minimum. The biggest draw occurred in PADD 2 which fell by 2.3 Mbbl to 8.1 Mbbl (0.3 Bgal), dropping stocks 1.5 MMbbl below the 5-year minimum for PADD 2. PADD 3 inventories were relatively flat, but remain 1.4 MMbbl below the 5-year minimum. For the 2021 – 2022 winter season we calculate that total U.S. propane inventories declined by 35.5 MMbbl compared to the 5-year average draw over this period of 45.8 MMbbl. Warm weather in the first half of winter (October – December) was the primary factor behind the lower inventory draw this heating season.

INVENTORY OUTLOOK

With April marking the start of the injection season, inventories are forecast to increase by 5.1 MMbbl which is well above the 5-year average build of 1.8 Mbbl. Our April estimated inventories of 38.1 MMbbl (1.6 B gal) will bring stocks back above the 5-year minimum by 2.7 MMbbl. Our propane model projects that total U.S. inventories will scrape along the bottom of the 5-year range throughout 2022. We believe the move to lower primary inventories is a long-term

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PROPANE MARKET UPDATE

PROPANE PRICES REMAIN HIGHLY VOLATILE

Over the last year the U.S. propane market has felt a little like Mr. Toad's Wild Ride with prices spiking above $1.50/gal in early October before plunging below a $1/gal in late December. In 2022, U.S. propane prices have continued to march higher closely tracking crude oil on a remarkably consistent percentage basis to WTI Cushing prices, averaging 57%, plus or minus 5% around that number every day. Consequently, propane volatility has mirrored that of crude, which has been whipsawed almost daily by the ongoing turmoil around the Russia-Ukraine war, sanctions on Russia and the fallout of those developments on energy markets. This market environment is likely to be with us for a while until the Russia-Ukraine conflict is no longer headline news each day. Until the conflict is resolved it appears likely that propane will continue to trade in tandem with crude oil at around 55% - 60% of WTI.

Non-LST (Enterprise) propane prices averaged 143.1 c/gal for March closing at 138.7 c/gal down 4% for the month. LST propane prices averaged 144.3 c/gal for February closing at 140.4 c/gal down 3% for the month. The Non-TET vs. TET price spread widened from 0.6 c/gal on March 1 to 1.7 c/gal on March 31. Conway prices averaged 140.9 c/gal during February, which represented a 2.2 c/gal discount to the average non-LST price.

As shown in Figure 1.3, the April forward curve for LST propane has flattened (lower backwardation) considerably relative to the March curve as prompt prices have declined more than out month prices.

Figure 1.2

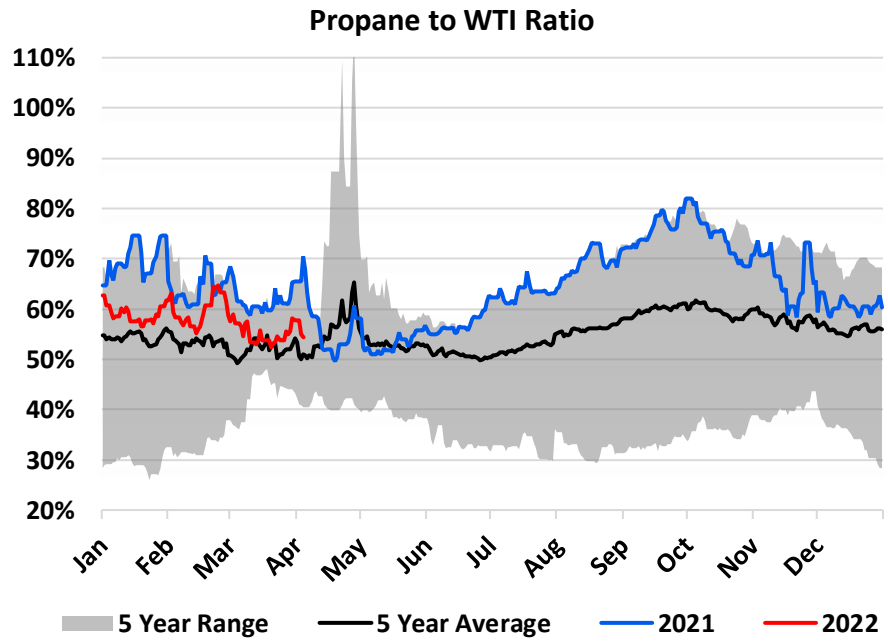
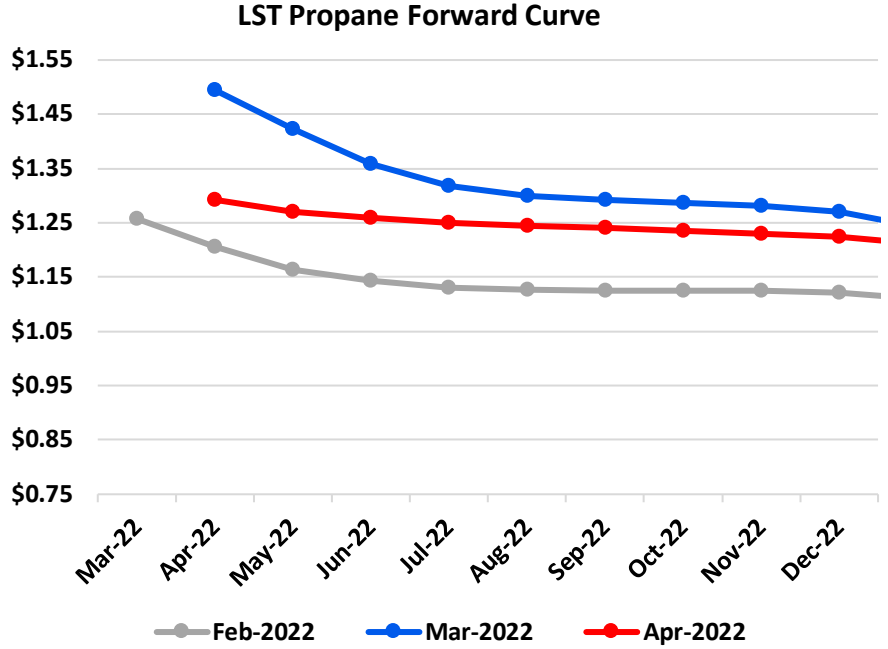


Figure 1.3



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CONWAY SPOT PROPANE PRICE BELOW MONT BELVIEU

CONWAY TRADES AT DISCOUNT TO BELVIEU

During March, Conway propane traded at a 2.1 c/gal average discount to Mont Belvieu compared to a 1.6 c/gal discount in February and a small premium in January. On April 4, the Conway discount to Belvieu increased further to 3.0 c/gal. This has tightened up the Conway prompt physical market pushing wet prompt premiums up to around 1-2 c/gal.

In contrast, during February 2021 Conway prices traded at a 13 c/gal average premium to Mont Belvieu during winter storm Uri. In February 2020, the differential was flipped, with Mont Belvieu trading about 3 c/gal over Conway, about where we are this year.

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 grey area is the differential on the right axis. The forward curves show a 3 c/gal Mont Belvieu premium until start of the Winter 2022-2023 season. The Conway discount is a typical indicator that the market is incenting barrels to flow from PADD 2 to PADD 3.

We expect Conway to trade at about a 3 c/gal discount to Mont Belvieu during the spring - summer unless low inventory builds require more barrels to stay in PADD 2 like last year.

Figure 2.5

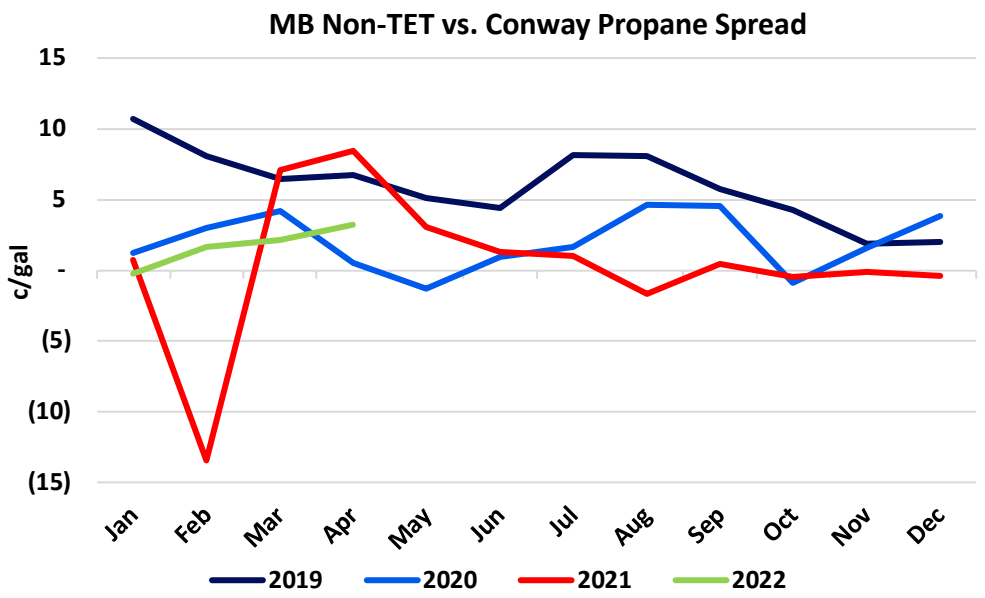
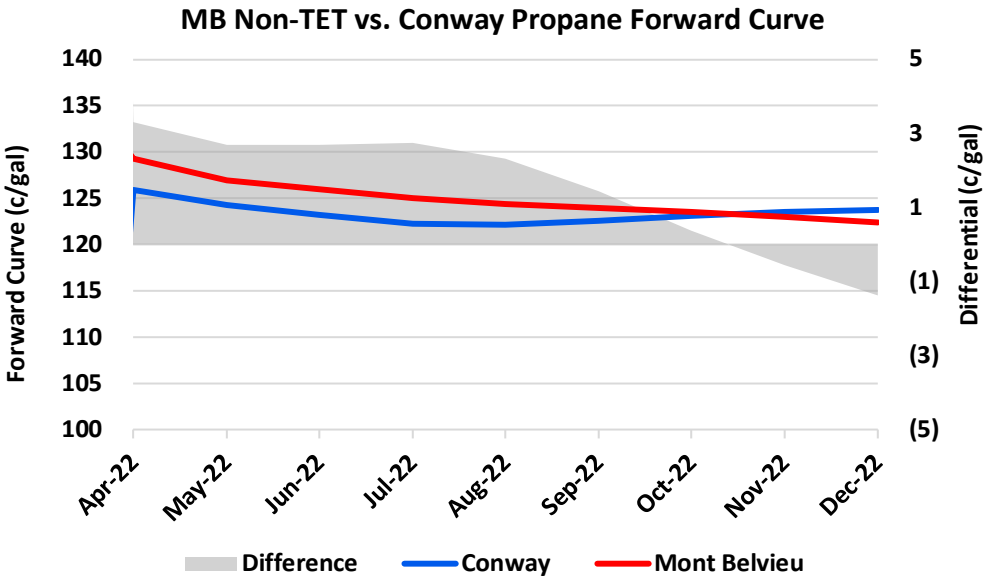


Figure 2.6



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U.S. PROPANE DEMAND

Table C:	MM gal / month						M bbl / day					
	MONTHLY			ESTIMATED		FORECAST	MONTHLY			ESTIMATED		FORECAST
	Dec-21	Jan-22	M/M	Feb-22	Mar-22	Apr-22	Dec-21	Jan-22	M/M	Feb-22	Mar-22	Apr-22
ResCom	797	1,024	226	827	729	572	613	786	174	703	560	454
Crop Drying	133	78	(55)	34	14	40	102	60	(42)	29	11	32
Industrial	126	133	8	111	107	92	96	102	6	95	82	73
Petrochemicals	298	297	(0)	254	288	279	229	228	(0)	216	221	221
PDH	121	121	-	112	124	113	93	93	-	95	95	90
Balancing	40	65	25	252	(71)	(363)	31	50	19	214	(54)	(288)
TOTAL PROPANE	1,516	1,719	203	1,590	1,191	734	1,164	1,320	156	1,352	915	582
Propylene	422	388	(34)	351	378	368	324	298	(26)	299	290	292
TOTAL DEMAND **	1,937	2,107	169	1,941	1,569	1,102	1,488	1,618	130	1,651	1,205	874
Weekly***	2,177	2,582	405	2,214	1,778		1,672	1,983	311	1,883	1,365	
Variance	239	475	236	273	209		184	365	181	232	160	

* 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 April 1, 2022.

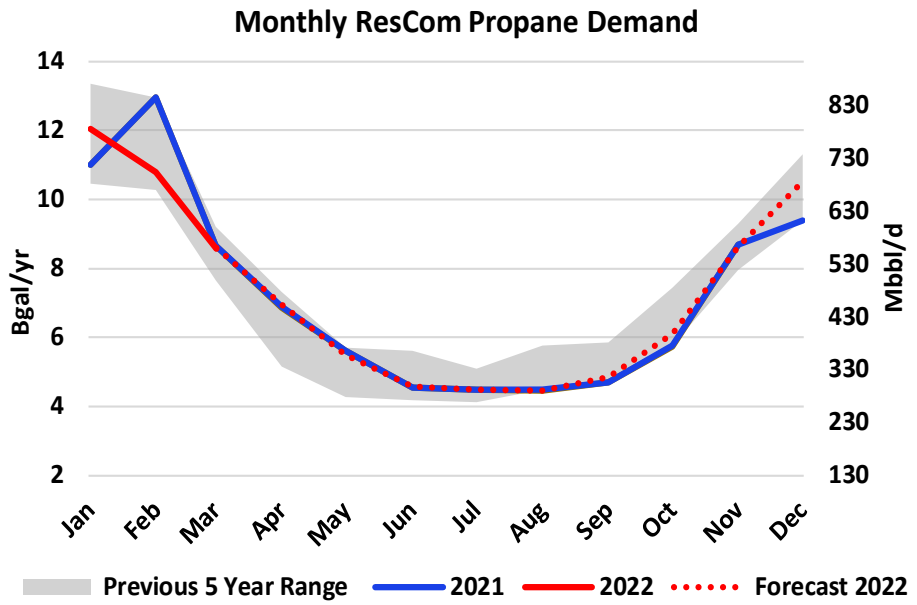
2021 – 2022 WINTER HDD's 3% BELOW 5-YEAR AVERAGE

Figure 3.1 shows our current forecast for ResCom demand through the end of the year. Residential and commercial propane demand dropped by 143 Mb/d in March to 560 Mb/d (729 MMgal/m). March ResCom demand was 1% lower than last year but 2% higher than the 5-year average demand. April ResCom demand is expected to decline further to 454 Mb/d (572 MMgal/m) as we move into the injection season. For a recap of the 2021-2022 winter season heating demand see the Appendix (Page 19).

WEAK STEAM CRACKER MARGINS

March propane demand as a steam cracker feedstock continued to be relatively weak at 221 Mb/d. We expect propane cracking to remain close to minimum levels around 210 Mb/d in April as margins for propane as feedstocks to crackers were negative in early April and ethane remains the preferred feedstock. Two ethane / propane crackers on the Gulf Coast restarted at the end of March following maintenance turnarounds (15 Mb/d propane demand). April PDH plant operating rates and propane demand are expected to stay close to maximum at the current propylene – propane price spread of 41c/lb.

Figure 3.1



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U.S. PROPANE EXPORTS

Table D:	U.S. Propane Exports Monthly and Weekly*					
	MONTHLY EIA			ESTIMATED		FORECAST
(Mbbl/d)	Dec-21	Jan-22	M/M	Feb-22	Mar-22	Apr-22
Gulf Coast	1,232	1,240	8	1,154	1,265	1,250
East Coast	104	80	(24)	109	123	160
West Coast	26	18	(8)	25	31	31
Other	3	4	1	5	4	5
TOTAL EXPORTS	1,365	1,342	(23)	1,293	1,423	1,446
Weekly	1,097	1,150	53	1,110	1,249	
Variance	(268)	(192)	76	(183)	(174)	

*Monthly data from EIA through January, weekly through the week of April 1, 2022.
See RBN's NGL Voyager Report for additional details on propane exports.

EAST COAST EXPORTS

East Coast propane exports from Marcus Hook increased to 123 Mb/d in March from a low rate of 106 Mb/d in February. PADD 1 exports are forecast to increase by 37 Mb/d in April to 160 Mb/d and average 150 Mb/d for 2022, 10 Mb/d higher than last year. There were no PADD 1 waterborne imports in March or April.

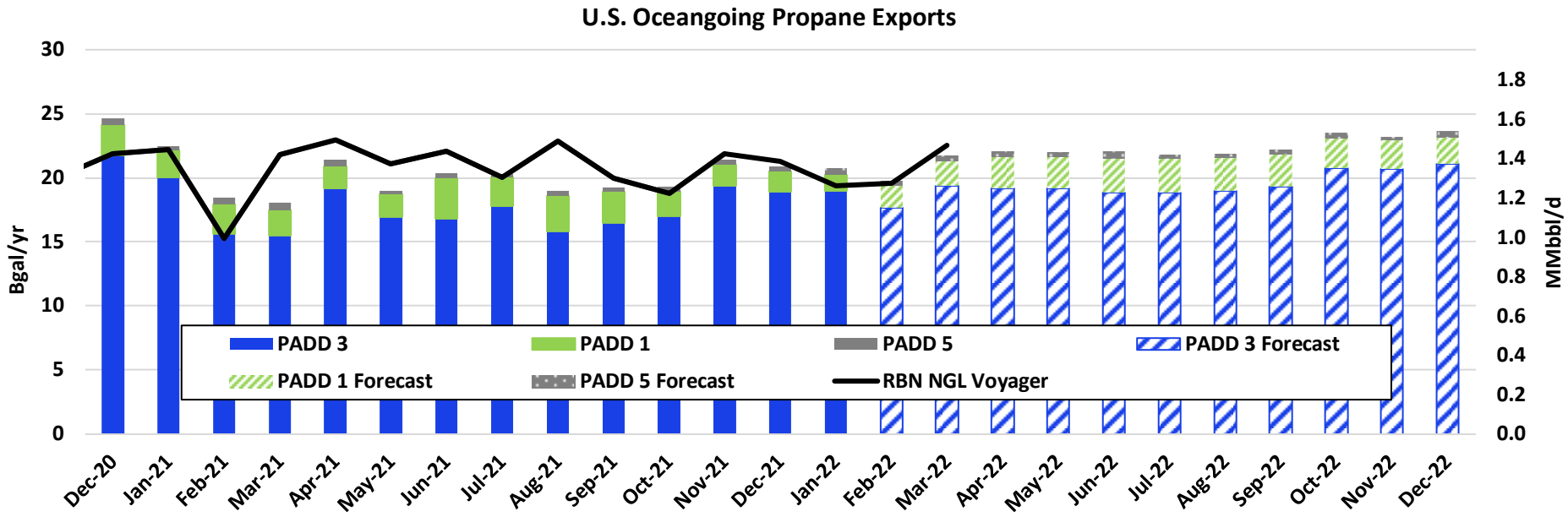
GULF COAST EXPORTS

Total propane exports from Gulf Coast terminals increased by 111 Mb/d in March to 1,265 Mb/d. In April, we expect PADD 3 exports to remain robust at 1,250 Mb/d as Asian and European demand remain strong. As shown in Figure 4.1, Gulf Coast exports are forecast to stay strong in 2022 averaging 1,269 Mb/d, up 139 Mb/d from last year.

WEST COAST EXPORTS

On the U.S. West Coast, propane exports increased by 6 Mb/d in March to 31 Mb/d. PADD 5 exports are expected to stay strong in April at 31 Mb/d and average 27 Mb/d for the year, up 3 Mb/d from 2021. All West Coast exports were destined for Asia (via Ferndale, Washington terminal) or Mexico (railcars/trucks).

Figure 4.1



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INTERNATIONAL PROPANE

Figure 4.2

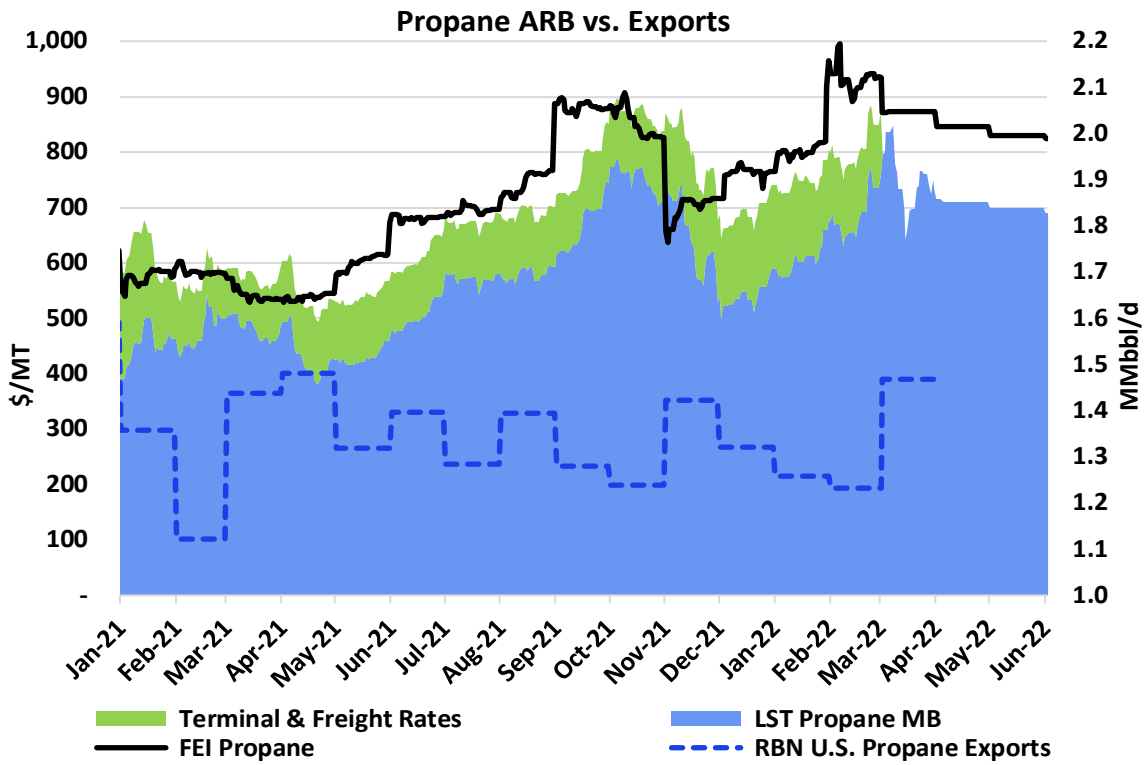
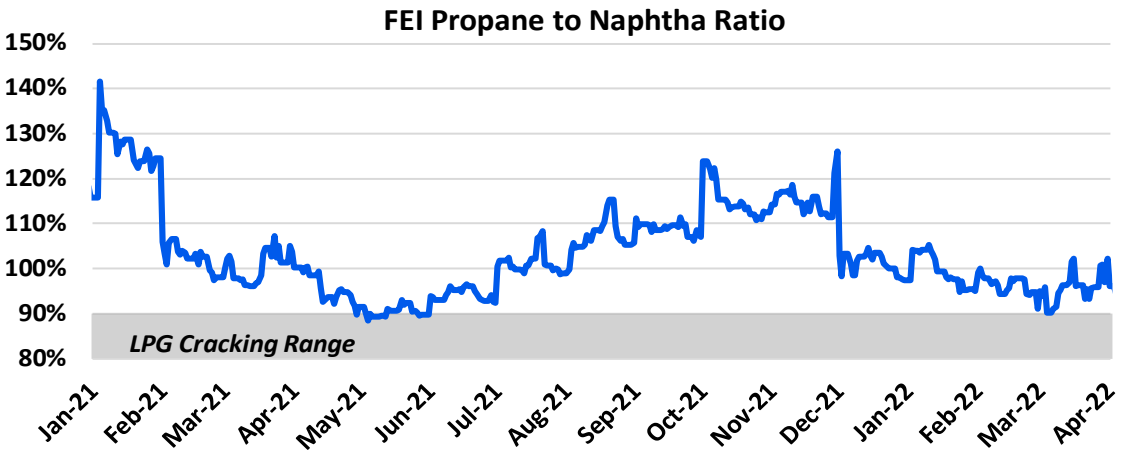


Figure 4.3



U.S. - ASIA ARB NARROWS

Saudi Aramco raised its April LPG contract price (CP) for propane to $940/MT (180 c/gal) marking the fourth consecutive monthly increase and the highest level since February 2014. The higher price likely will support prices in Asia, which should improve the economics of exporting propane from the U.S.

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). On April 5, the Asian ARB for April-May was $137/MT, or 26.3 c/gal. Considering terminal fees and freight costs, the April-May Asian ARB was narrowly closed (positive, and thus non-economic) at $9/MT, or 1.6 c/gal.

Spot freight rates for Very Large Gas Carriers (VLGCs) continued to be volatile so far in 2022. Rates initially fell steeply in January through the first part of March and then increased from that time through early April. Spot VLGC freight rates for the key Houston to Chiba route were strong in March increasing by $32/mt to $110/mt.

Figure 4.3 shows the ratio of the Asian FEI propane price to naphtha in the same region, which is an important factor to consider when looking at Asian propane demand. When the ratio rises above 90%, steam crackers typically find it less economical to crack LPG as opposed to using naphtha as the primary feedstock. On April 1 the ratio sat at 96%, up from 95% on March 1. The current price relationship indicates that Asian steam crackers are likely to favor naphtha in place of propane volumes.

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U.S. PROPANE PRODUCTION

Figure 5.1

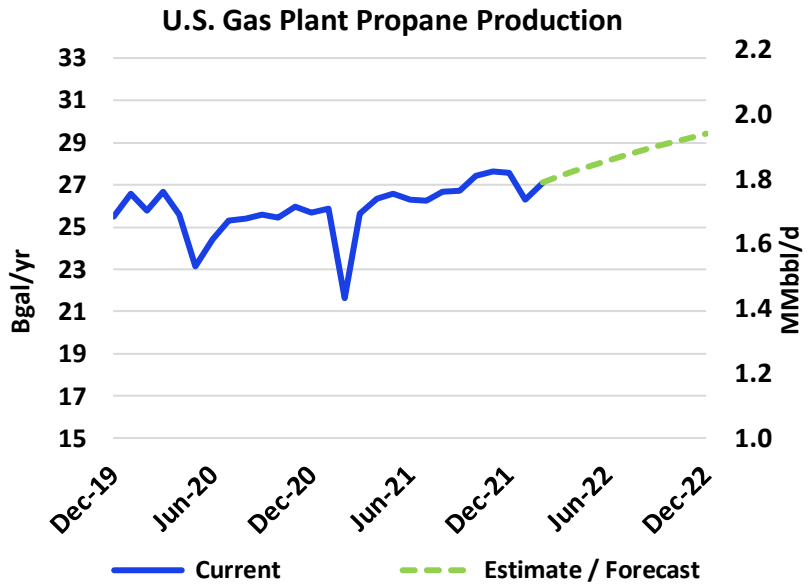

Figure 5.2

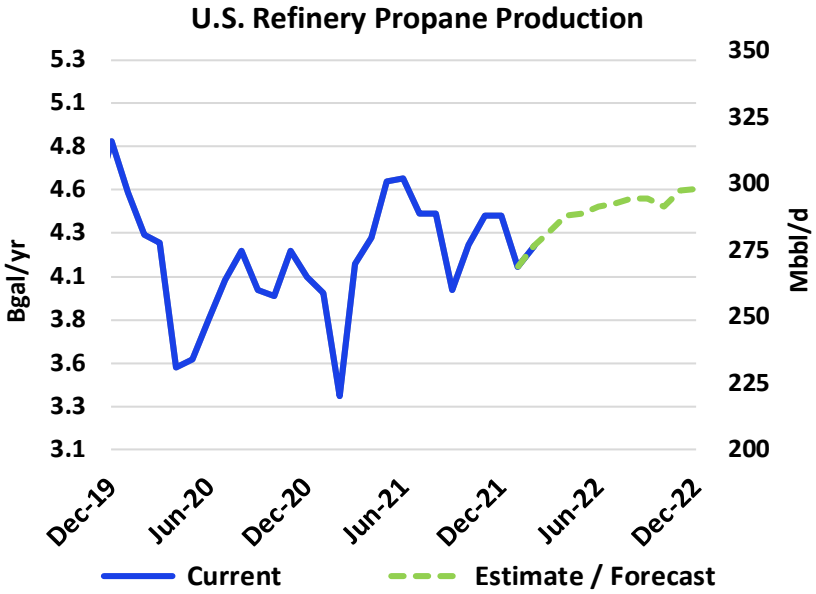

Table E:	U.S. Propane Production Monthly and Weekly*					
	MONTHLY EIA			ESTIMATED		FORECAST
(Mbbl/d)	Dec-21	Jan-22	M/M	Feb-22	Mar-22	Apr-22
Gas Plant	1,821	1,737	(84)	1,791	1,807	1,824
Refinery	288	269	(19)	277	282	288
TOTAL PROPANE	2,109	2,006	(103)	2,068	2,089	2,113
Propylene	306	278	(28)	288	278	280
TOTAL PRODUCTION	2,415	2,284	(131)	2,355	2,367	2,393
Weekly**	2,423	2,412	(11)	2,376	2,350	
Variance	8	128	120	21	(17)	

* 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 April 1, 2022.

JANUARY GAS PLANT PRODUCTION DROPS SHARPLY

According to the EIA's monthly report released last week, there was a sharp drop in gas plant production for January of about 5% or 84 Mb/d. Based upon the latest EIA weekly report, we estimate that March gas plant production increased by 16 Mb/d to 1,807 Mb/d.

Our propane model projects gas plant production to increase by 17 M/b/d in April to 1,824 Mb/d and average 1,859 Mb/d for the year, up 127 Mb/d from 2021.

REFINERY PRODUCTION RECOVERS FROM JANUARY OUTAGES

March refinery propane production rose by 5 Mb/d to 282 Mb/d as operating rates continued to recover from the weather-related outages in January. March refinery utilization was 91%, up from 4% from last month.

We forecast April refinery production to increase by 6 Mb/d to a more normal level of 288 Mb/d as capacity utilization increases above 90%. For 2022, we expect refinery propane production to average 289 Mb/d, up 12 Mb/d from last year, as refinery capacity utilization increases to 89%, up 3% from 2021.

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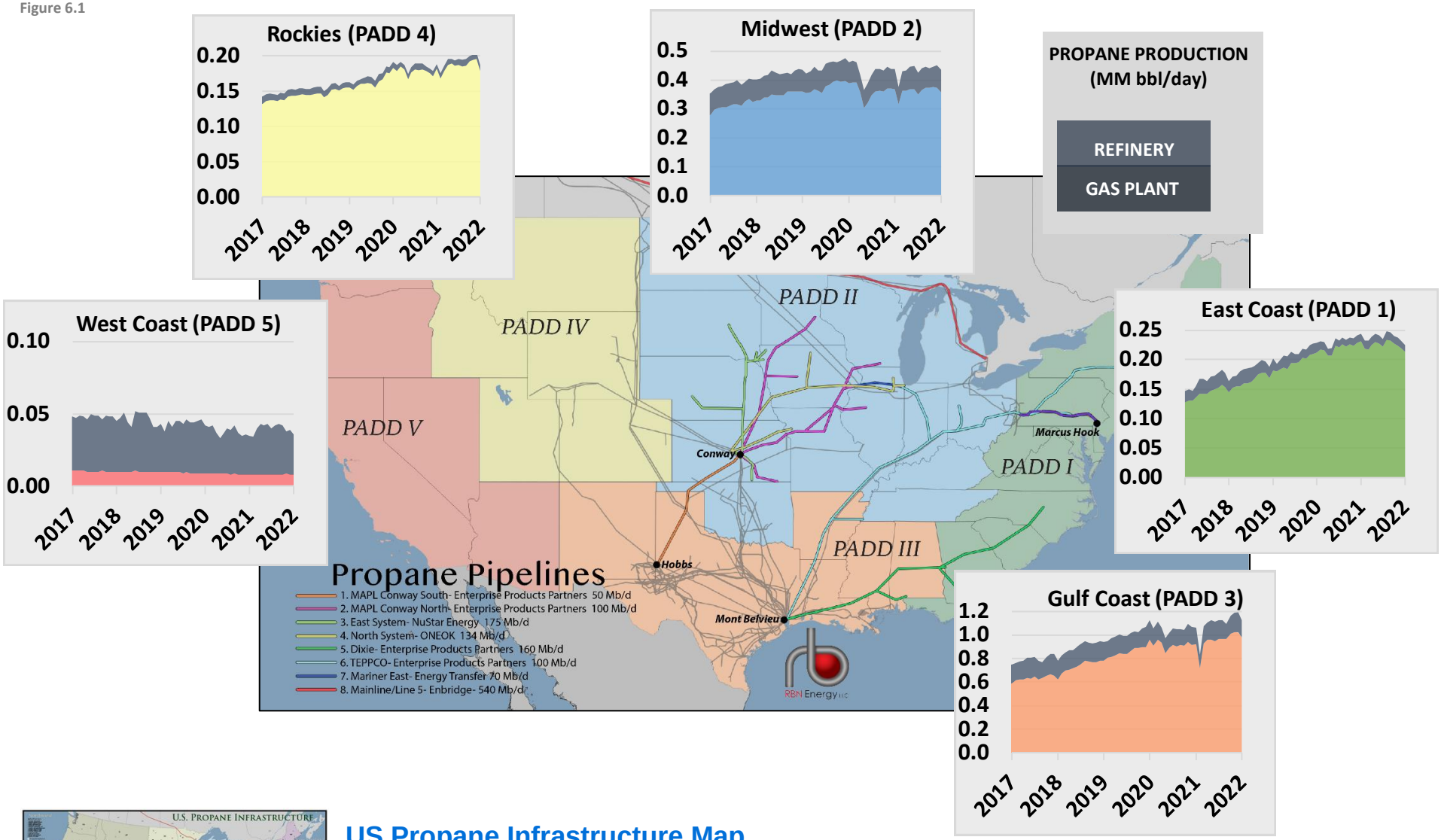
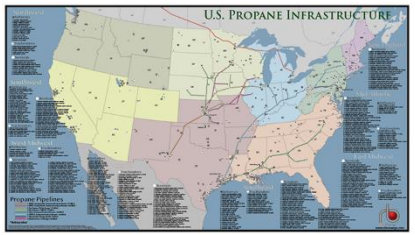
U.S. PROPANE INFRASTRUCTURE MAP

Figure 6.1





US Propane Infrastructure Map

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

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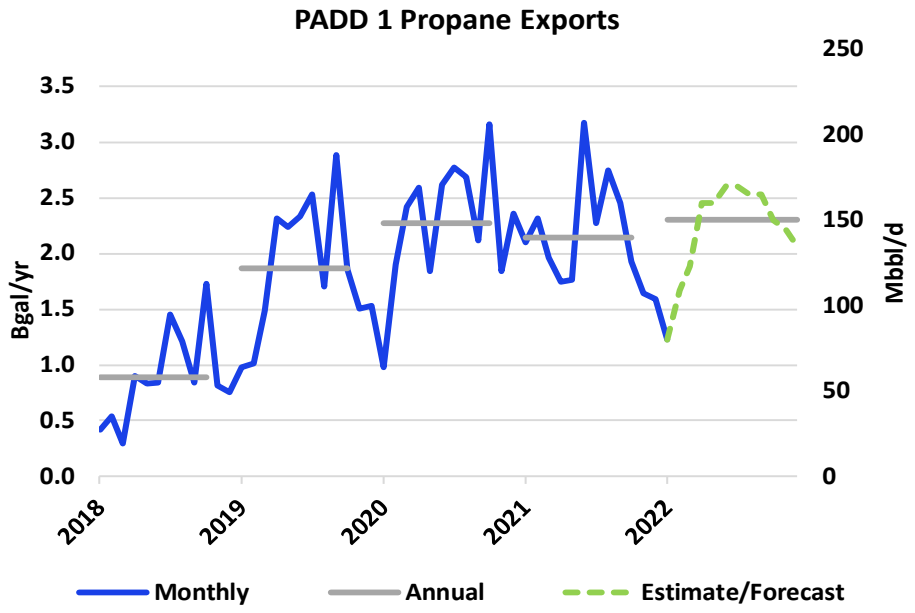
PADD 1: PROPANE SUPPLY & DEMAND

Table F:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Production	303	293	265	300	295	306	298	233	225	225	231	234	235	237
Gas Plants	286	277	251	284	277	287	280	220	213	213	218	220	221	222
Refinery	17	16	14	16	18	19	18	13	12	12	12	14	14	14
Imports	65	91	60	52	32	26	19	50	70	51	40	25	20	15
Net Inter-PADD Transfers	266	296	263	249	222	199	183	204	227	224	191	176	153	145
TOTAL SUPPLY	634	680	588	602	548	531	500	487	522	500	462	435	408	397
Demand (Prod. Supplied)	564	665	542	429	311	290	255	433	511	461	330	247	223	202
Exports	135	104	128	160	202	208	214	104	80	109	123	160	160	170
Stock Change	(65)	(89)	(82)	12	35	33	31	(50)	(68)	(70)	9	28	25	25
TOTAL DISPOSITION	634	681	588	602	548	531	500	487	523	500	462	435	408	397
TOTAL INVENTORY	316	227	145	158	193	225	257	7,521	5,412	3,462	3,756	4,590	5,366	6,108

Figure 7.1



INSIGHTS & ANALYSIS

PADD 1 inventories increased by 294 Mbbl to 3.8 MMbbl (158 MMgal) in March which was above the 5-year average inventory change of -649 Mbbl for the month. The small inventory build moved PADD 1 stocks to 309 Mbbl above the 5-year average. For the 2021 – 2022 winter season, we estimate PADD 1 inventories fell by 4.5 MMbbl which is slightly higher than the 5-year average winter season draw of 4.1 MMbbl.

East Coast propane exports out of the Marcus Hook terminal increased to 123 Mb/d in March from a low rate of 109 Mb/d in February. Production in PADD 1 has continued to be relatively flat over the past several months, ranging from 225 Mb/d in January to 231 Mb/d in March.

PADD 1 OUTLOOK

Our propane model projects PADD 1 inventories to build by 834 Mbbl in April to 4.6 MMbbl (193 MMgal) leaving stocks above the 5-year average but below the 5-year maximum where we expect them to stay for the remainder of the year. As shown in Figure 7.1, East Coast exports are expected to increase by 37 Mb/d in April to 160 Mb/d and average 150 Mb/d for 2022, 10 Mb/d higher than last year. PADD 1 production is expected to increase slightly to 234 Mb/d in April but stay flat for the year compared to 2021.

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PADD 2: PROPANE SUPPLY & DEMAND

Table G:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Production	586	566	515	578	564	586	572	450	435	438	444	447	450	454
Gas Plants	487	466	433	485	473	492	479	374	358	368	373	375	378	380
Refinery	99	100	82	93	91	94	93	76	77	70	71	72	72	74
Imports	81	72	42	55	32	33	32	62	55	36	42	25	25	25
Net Inter-PADD Transfers	(423)	(389)	(403)	(471)	(503)	(440)	(413)	(325)	(299)	(343)	(362)	(400)	(338)	(328)
TOTAL SUPPLY	829	815	669	739	656	764	763	637	626	569	567	520	587	606
Demand (Prod. Supplied)	322	495	359	253	28	13	20	247	380	305	194	23	10	16
Exports	4	5	5	6	6	9	7	3	4	5	4	5	7	5
Stock Change	(82)	(251)	(210)	(98)	57	157	165	(63)	(193)	(179)	(75)	45	120	131
TOTAL DISPOSITION	243	249	154	161	92	178	191	187	191	131	124	73	137	151
TOTAL INVENTORY	900	650	440	342	399	556	721	21,438	15,469	10,468	8,144	9,505	13,237	17,156

INSIGHTS & ANALYSIS

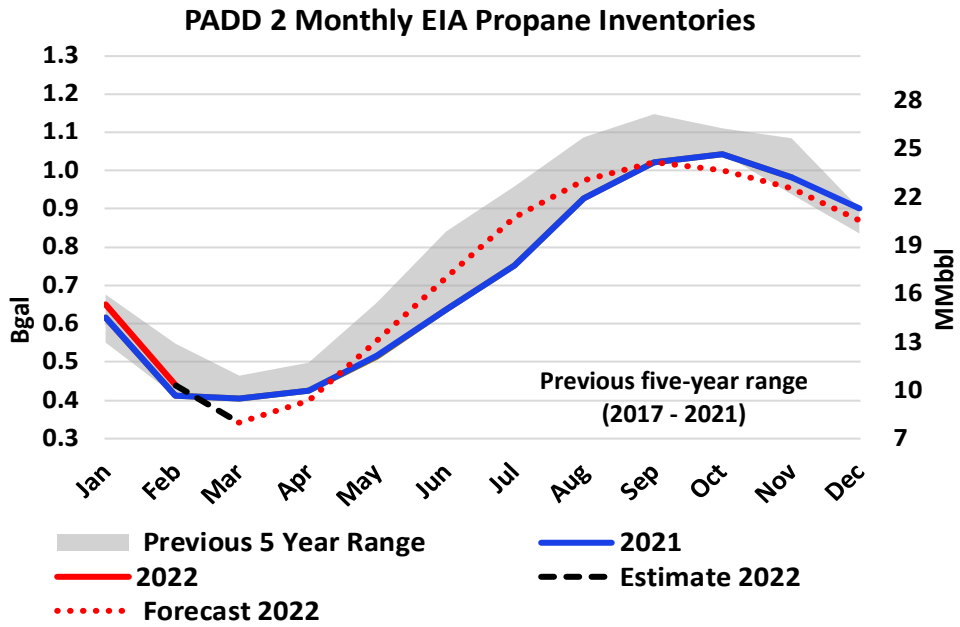
In March, PADD 2 inventories fell by 2.3 MMbbl to 8.1 MMbbl (342 MMgal) which was well above the 5-year average draw of 1.0 MMbbl. PADD 2 inventories are now 1.5 Mbbl below the 5-year minimum and are at the same level as stocks during the Polar Vortex propane crisis in March 2014. For the 2021 – 2022 winter season, we estimate PADD 2 inventories fell by 16.2 MMbbl which is slightly less than the 5-year average winter season draw of 16.7 MMbbl. PADD 2 production in March increased by 6 Mb/d to 444 Mb/d but remains rangebound around 450 Mb/d where we expect it to stay during 2022. Net inter-PADD transfers increased to 362 Mb/d in March, up from 343 M b/d in February and the 2021 average level of 348 Mb/d.

PADD 2 OUTLOOK

Our propane model estimates PADD 2 inventories to build by 1.4 Mbbl in April to 9.5 MMbbl (399 MMgal) keeping stocks below the 5-year minimum where we expect them to remain before moving into the middle of the 5-year range during the summer.

We expect PADD 2 imports from Canada will decline by around 10 Mb/d in 2022 as British Columbia terminals ramp-up exports to Asian markets

Figure 7.2



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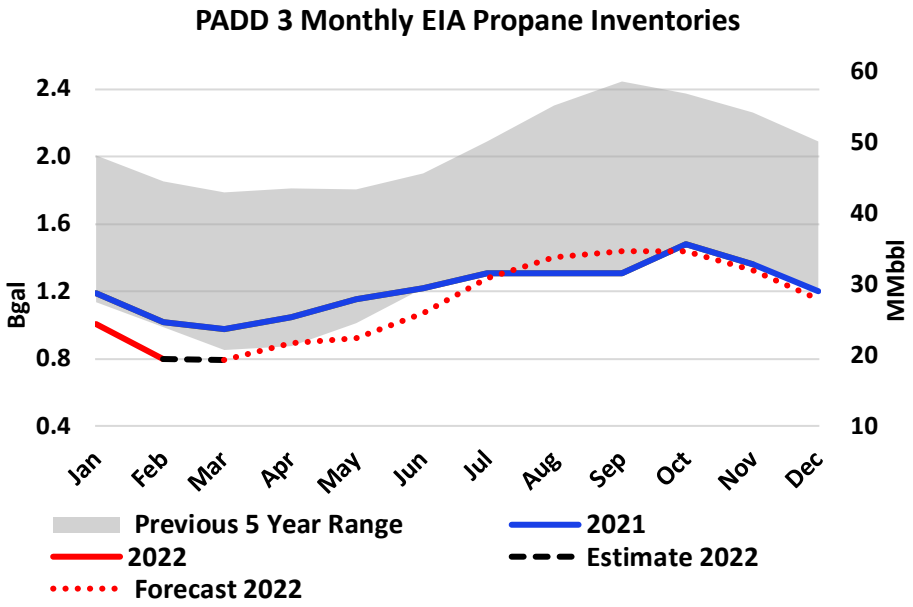
PADD 3: PROPANE SUPPLY & DEMAND

Table H:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Production	1,549	1,462	1,387	1,545	1,510	1,578	1,543	1,190	1,123	1,179	1,187	1,199	1,212	1,225
Gas Plants	1,332	1,275	1,199	1,331	1,305	1,365	1,337	1,023	979	1,019	1,022	1,036	1,049	1,061
Refinery	217	187	188	214	205	213	206	167	144	160	164	163	163	164
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Inter-PADD Transfers	357	276	286	411	431	401	402	274	212	243	316	342	308	319
TOTAL SUPPLY	3,456	3,200	3,060	3,502	3,451	3,557	3,489	2,654	2,458	2,602	2,690	2,739	2,732	2,769
Demand (Prod. Supplied)	461	384	524	316	267	323	246	354	295	446	243	212	248	195
Exports	1,604	1,614	1,357	1,647	1,575	1,628	1,550	1,232	1,240	1,154	1,265	1,250	1,250	1,230
Stock Change	(160)	(260)	(208)	(7)	99	29	149	(123)	(200)	(177)	(5)	79	22	119
TOTAL DISPOSITION	1,905	1,738	1,673	1,957	1,941	1,979	1,945	1,463	1,335	1,423	1,503	1,541	1,520	1,544
TOTAL INVENTORY	1,202	1,006	798	791	890	919	1,069	28,615	23,948	18,989	18,827	21,196	21,883	25,442

Figure 7.3



Source: EIA

INSIGHTS & ANALYSIS

PADD 3 inventories fell by 162 Mbbl in March to 18.8 MMbbl (791 MMgal) which was less than the 5-year average inventory draw of 817 Mbbl for the month. Despite the small draw PADD 3 stocks remain 1.4 Mbbl below the 5-year minimum. For the 2021 – 2022 winter season, we calculate that PADD 3 inventories fell by 12.3 MMbbl which was lower than the 5-year average winter season draw of 20.5 MMbbl.

Gulf Coast propane exports increased to 1,265 Mb/d in March from a low rate of 1,154 Mb/d in February. After falling sharply in January, we estimate that March gas plant production increased by 16 Mb/d to 1,202 Mb/d, in line with December 2021 production.

PADD 3 OUTLOOK

Our model estimates PADD 3 inventories will increase by 2.4 MMbbl in April to 21.2 MMbbl (890 MMgal) which is 0.3 MMbbl above the 5-year minimum. We expect PADD 3 inventories will stay at the bottom of the five-year range for the rest of the year. PADD 3 gas plant production is projected to increase by 14 Mb/d in April to 1,050 Mb/d. Gulf Coast exports are expected to remain robust in April at 1,250 Mb/d and average 1,269 Mb/d for the year, 139 Mb/d higher than last year.

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PADD 4: PROPANE SUPPLY & DEMAND

Table I:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Production	266	243	224	252	242	250	242	204	187	190	193	192	192	192
Gas Plants	255	233	214	241	233	241	234	196	179	182	185	185	185	185
Refinery	10	10	9	11	9	9	9	8	8	8	8	7	7	7
Imports	22	21	14	15	10	10	9	17	16	12	12	8	8	7
Net Inter-PADD Transfers	(210)	(199)	(163)	(186)	(163)	(178)	(188)	(161)	(153)	(139)	(143)	(129)	(136)	(149)
TOTAL SUPPLY	78	65	74	81	90	83	63	60	50	63	62	71	64	50
Demand (Prod. Supplied)	83	81	101	97	77	76	63	64	62	86	74	61	58	50
Exports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock Change	(5)	(16)	(27)	(16)	13	7	0	(4)	(12)	(23)	(12)	10	5	0
TOTAL DISPOSITION	78	65	74	81	90	83	63	60	50	63	62	71	64	50
TOTAL INVENTORY	119	103	77	61	74	81	81	2,833	2,464	1,831	1,449	1,754	1,924	1,935

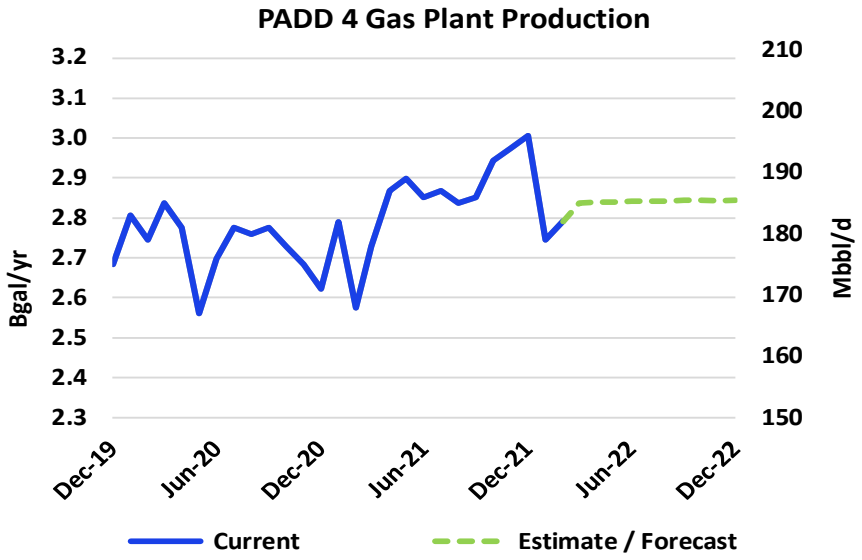
INSIGHTS & ANALYSIS

PADD 4 inventories dropped by 381 Mbbl to 1.5 MMbbl (61 MMgal) in March which was above the 5-year average inventory draw of 42 Mbbl for the month. The inventory draw moved PADD 4 stocks slightly above the 5-year average. For the 2021 – 2022 winter season, we estimate PADD 4 inventories fell by 1.2 MMbbl which is higher than the 5-year average winter season draw of 0.5 MMbbl. Gas plant production in PADD 4 has continued to be relatively flat over the past several months, ranging from 179 Mb/d in January to 185 Mb/d in March.

PADD 4 OUTLOOK

Our propane model projects PADD 4 inventories to build by 305 Mbbl in April to 1.7 MMbbl (74 MMgal) leaving stocks in the middle of the 5-year range where we expect them to stay for the remainder of the year. As shown in Figure 7.4, PADD 4 gas plant production is expected to remain unchanged in April at 185 Mb/d and average 185 Mb/d for the year, flat with 2021.

Figure 7.4



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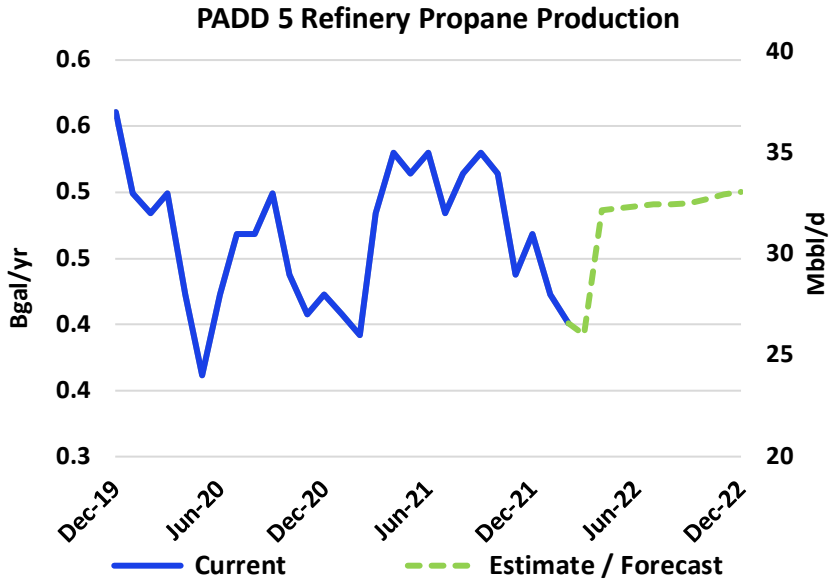
PADD 5: PROPANE SUPPLY & DEMAND

Table J:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Production	51	47	41	45	51	53	51	39	36	35	34	41	41	41
Gas Plants	10	10	10	11	11	11	10	8	8	8	8	8	8	8
Refinery	40	36	31	34	41	42	41	31	28	27	26	32	32	32
Imports	36	30	37	41	36	23	22	28	23	31	31	29	18	18
Net Inter-PADD Transfers	12	16	17	37	13	17	16	9	12	15	28	11	13	13
TOTAL SUPPLY	99	92	95	122	100	93	89	76	71	81	94	80	71	71
Demand (Prod. Supplied)	86	94	64	95	50	41	33	66	72	55	73	40	32	26
Exports	34	23	30	40	39	35	52	26	18	25	31	31	27	42
Stock Change	(22)	(26)	1	(13)	11	17	4	(17)	(20)	1	(10)	9	13	3
TOTAL DISPOSITION	98	91	95	122	100	93	89	75	70	81	94	80	71	71
TOTAL INVENTORY	70	45	46	33	44	60	65	1,670	1,064	1,085	787	1,045	1,438	1,543

Figure 7.5



INSIGHTS & ANALYSIS

PADD 5 inventories declined by 299 Mbbl in March to 0.8 MMbbl (33 MMgal) which was slightly higher than the 5-year average inventory draw of 220 Mbbl for the month. The inventory draw moved PADD 5 stocks to 14 Mbbl below the 5-year maximum. For the 2021 – 2022 winter season, we estimate PADD 5 inventories fell by 1.3 MMbbl which is lower than the 5-year average winter season draw of 1.9 MMbbl. Refinery production in PADD 5 was down 1 Mb/d in March at 26 Mb/d as capacity utilization remained relatively weak at 87%.

PADD 5 OUTLOOK

Our propane model projects PADD 5 inventories to build by 258 Mbbl in April to 1.1 MMbbl (44 MMgal) leaving stocks above the 5-year average but slightly below the 5-year maximum where we expect them to stay for the rest of the year. As shown in Figure 7.5, refinery production in PADD 5 is expected to increase by 6 Mb/d in April to 32 Mb/d as capacity utilization moves above 90% and average 31 Mb/d for 2022, 1 Mb/d lower than last year. Imports are forecast to decline to 29 Mb/d in April and average 24 Mb/d for the year, down 4 Mb/d from 2021. PADD 5 exports are expected to stay strong in April at 31 Mb/d and average 27 Mb/d for the year, up 3

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KEY ENERGY PRICES

Table K: Prices											
		Current	Prior Week			Prior Month			Prior Year		
Product	Units	1-Apr-22	25-Mar-22	W/W	W/W %	1-Mar-22	M/M	M/M %	1-Apr-21	Y/Y	Y/Y %
Brent Crude	$/bbl	**104.4**	120.7	(16.3)	-13.5%	105.0	(0.6)	-0.6%	64.9	39.5	60.9%
WTI Cushing Crude	$/bbl	**99.3**	113.9	(14.6)	-12.8%	103.4	(4.1)	-4.0%	61.5	37.8	61.5%
Henry Hub Natural Gas	$/MMbtu	**5.72**	5.57	0.15	2.7%	4.57	1.15	25.1%	2.64	3.08	116.7%
Propane											
Mont Belvieu Non-TET	c/gal	**136.8**	145.9	(9.2)	-6.3%	144.8	(8.0)	-5.5%	95.8	41.0	42.8%
Mont Belvieu TET	c/gal	**137.3**	145.9	(8.6)	-5.9%	145.4	(8.1)	-5.5%	94.7	42.6	45.0%
Conway	c/gal	**132.6**	142.3	(9.7)	-6.8%	141.6	(9.0)	-6.4%	83.5	49.1	58.8%
Edmonton*	c/gal	**112.7**	118.0	(5.3)	-4.5%	117.2	(4.5)	-3.8%	54.6	58.0	106.2%
European (ARA)	$/MT	**800.5**	884.6	(84.0)	-9.5%	877.1	(76.5)	-8.7%	524.6	276.0	52.6%
Asian (FEI)	$/MT	**871.1**	941.8	(70.7)	-7.5%	918.5	(47.4)	-5.2%	572.9	298.2	52.1%
Saudi CP	$/MT	**850.9**	939.3	(88.4)	-9.4%	899.5	(48.7)	-5.4%	530.1	320.8	60.5%

Figure 8.1

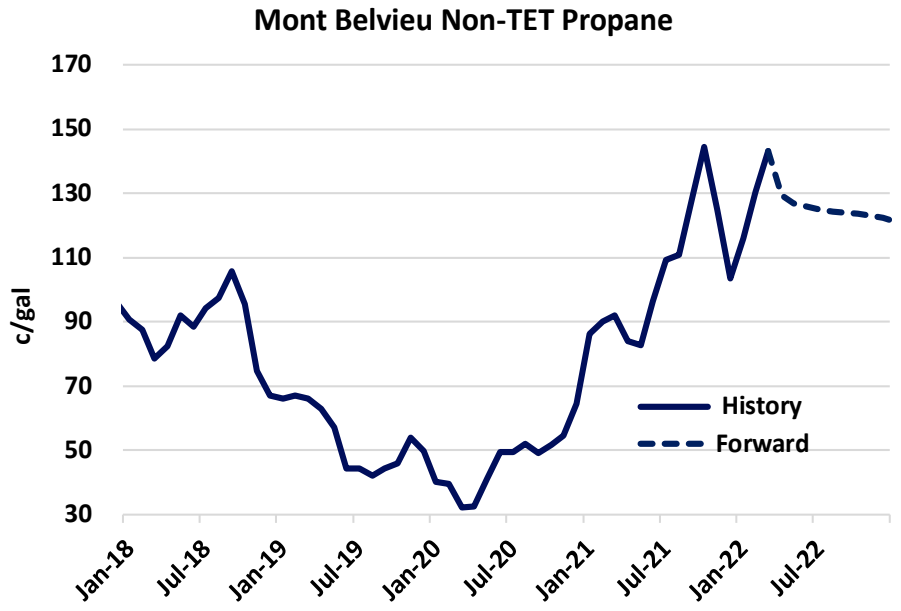
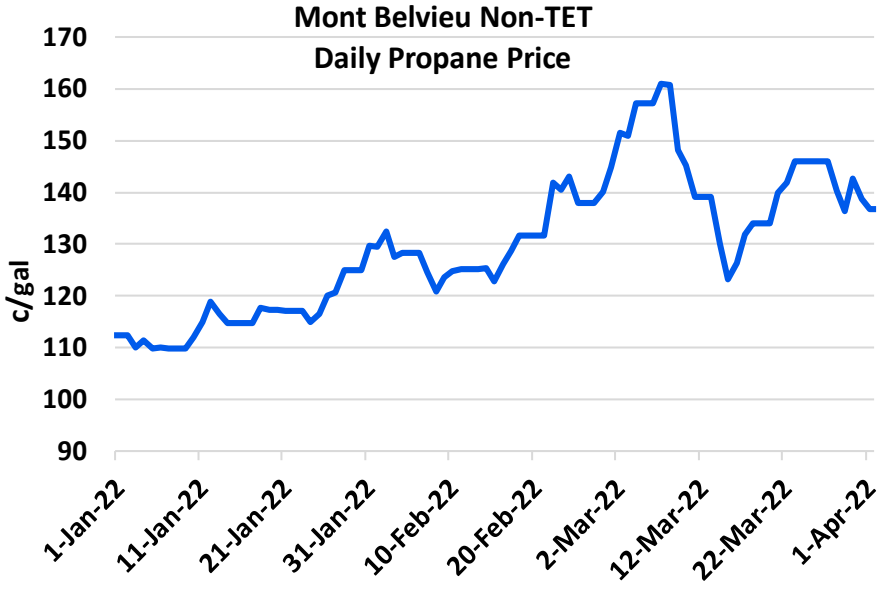


Figure 8.2



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MONTHLY PROPANE PRICE TRENDS

Figure 8.3

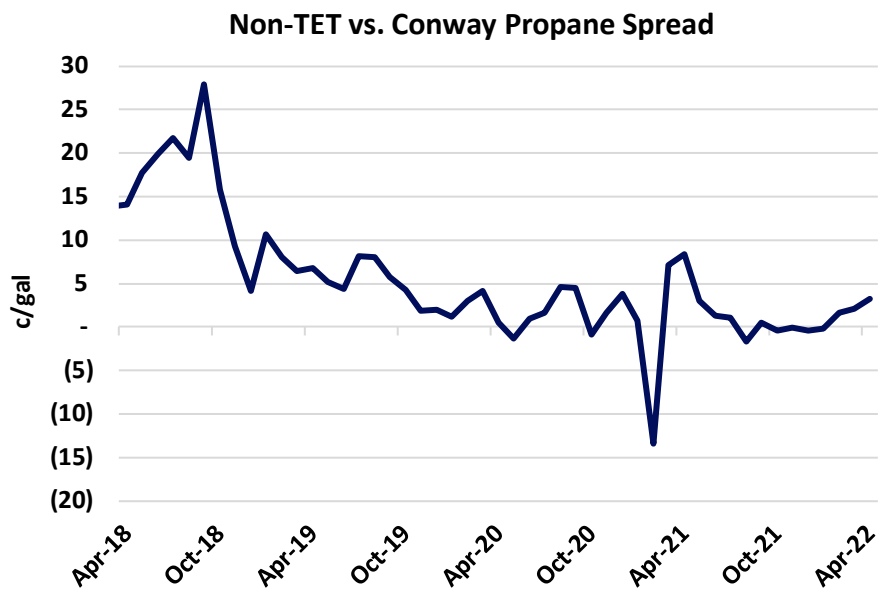

Figure 8.4

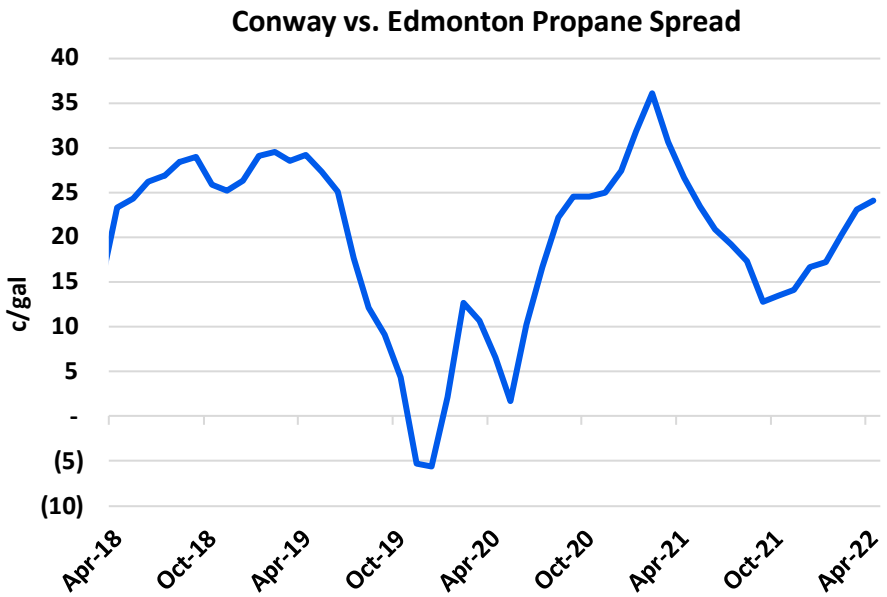

Figure 8.5

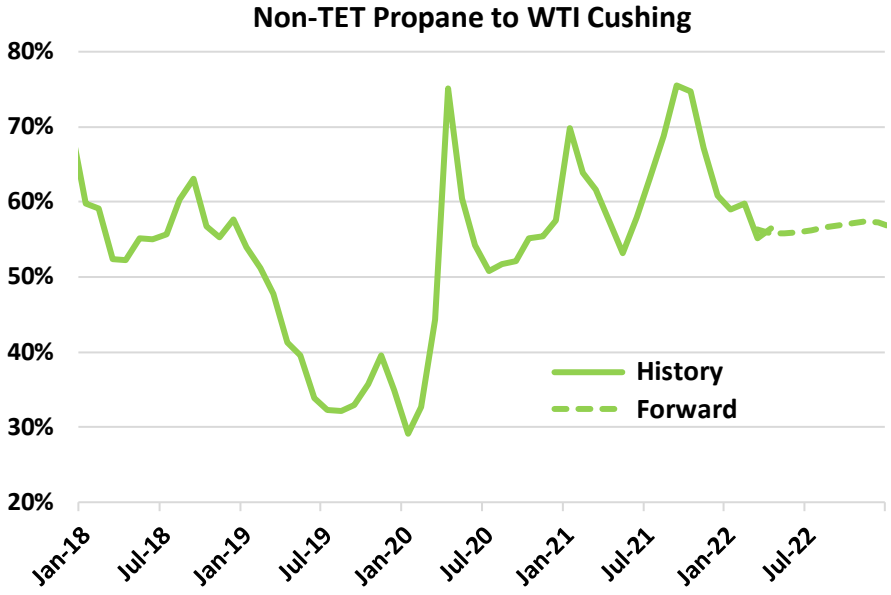

Table L:	MB TET Propane / WTI Cushing				
%	2019	2020	2021	2022	Y/Y %
Jan	54.6%	31.5%	70.4%	59.2%	-15.8%
Feb	51.5%	32.8%	65.0%	60.4%	-7.1%
Mar	48.3%	45.3%	62.0%	55.6%	-10.3%
Q1	51.5%	36.6%	65.8%	58.3%	-11.3%
Q2	39.0%	60.5%	55.5%		
Q3	33.3%	50.6%	69.2%		
Q4	36.9%	56.0%	67.7%		
Year	40.1%	51.0%	64.6%	58.3%	-9.6%

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INTERNATIONAL PROPANE PRICE SPREADS

Figure 9.1

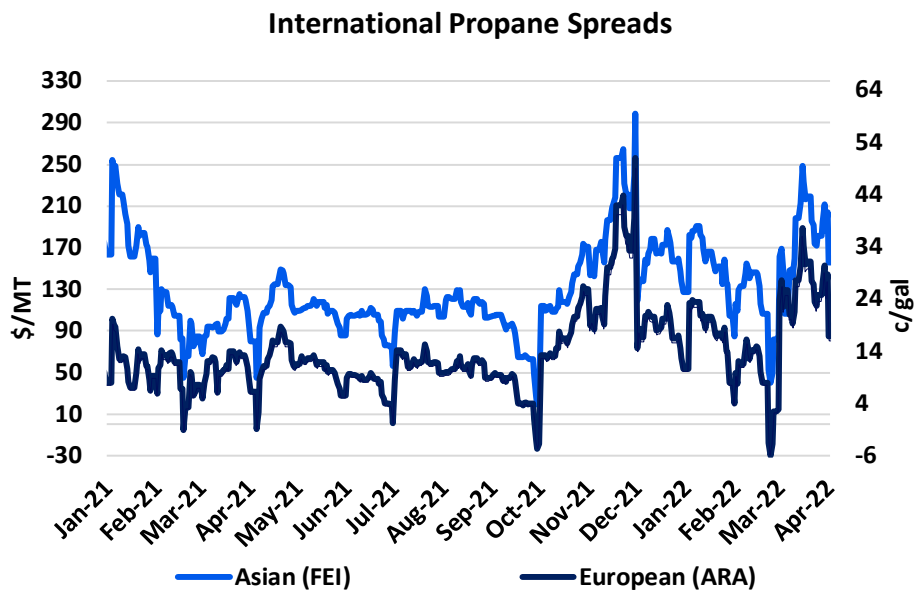

Figure 9.2

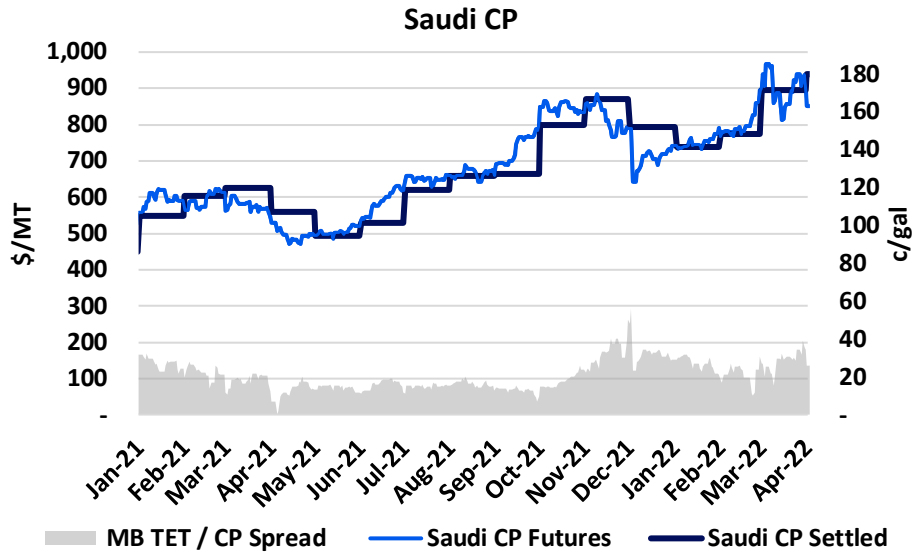

Table M:	Asian FEI / MB TET Spread				
$/MT	2019	2020	2021	2022	Y/Y %
Jan	97.8	251.5	186.5	154.3	-17.3%
Feb	97.6	174.1	96.5	115.0	19.1%
Mar	118.9	151.8	102.4	181.7	77.5%
Q1	105.0	192.9	129.5	151.5	17.0%
Q2	159.0	97.6	106.1		
Q3	156.5	91.0	101.1		
Q4	211.5	175.0	163.6		
Year	158.3	139.1	125.1	151.5	21.1%

Table N:	European ARA / MB TET Spread				
$/MT	2019	2020	2021	2022	Y/Y %
Jan	56.0	181.6	56.6	88.3	55.9%
Feb	64.4	110.5	46.5	44.4	-4.7%
Mar	77.6	72.0	56.6	134.5	137.8%
Q1	66.0	121.6	53.5	90.5	69.3%
Q2	102.7	44.8	50.7		
Q3	91.9	49.8	48.3		
Q4	139.0	89.5	111.3		
Year	100.1	76.4	66.0	90.5	37.1%

Table O:	Saudi CP / MB TET Spread				
$/MT	2019	2020	2021	2022	Y/Y %
Jan	74.3	275.3	142.7	143.6	0.6%
Feb	98.6	197.3	116.7	112.8	-3.3%
Mar	143.9	97.1	95.5	150.8	57.8%
Q1	105.8	189.7	118.4	136.5	15.3%
Q2	150.5	103.4	74.8		
Q3	132.7	107.5	77.5		
Q4	183.2	150.0	144.3		
Year	143.3	137.6	103.7	136.5	31.6%

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U.S. PROPANE SUPPLY & DEMAND BALANCE DETAIL

Table P:	MM gal / month							M bbl / day						
	EIA MONTHLY		ESTIMATED		FORECAST			EIA MONTHLY		ESTIMATED		FORECAST		
	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Gas Processing	2,371	2,262	2,106	2,352	2,299	2,397	2,340	1,821	1,737	1,791	1,807	1,824	1,841	1,857
Refinery Propane	384	350	326	367	363	376	367	295	269	277	282	288	289	292
Imports	204	214	153	163	109	92	81	157	164	130	125	87	71	65
TOTAL SUPPLY	2,959	2,825	2,584	2,883	2,771	2,865	2,789	2,273	2,170	2,197	2,214	2,199	2,200	2,213
Product Supplied	1,516	1,719	1,590	1,191	734	743	616	1,164	1,320	1,352	915	582	571	489
ResCom	797	1,024	827	729	572	465	375	613	786	703	560	454	357	298
Crop Drying	133	78	34	14	40	40	40	102	60	29	11	32	31	32
Industrial	126	133	111	107	92	94	92	96	102	95	82	73	72	73
Petrochemicals	298	297	254	288	279	281	279	229	228	216	221	221	216	221
PDH	121	121	112	124	113	121	117	93	93	95	95	90	93	93
Balancing	40	65	252	(71)	(363)	(259)	(287)	31	50	214	(54)	(288)	(199)	(228)
Exports	1,777	1,747	1,521	1,853	1,822	1,880	1,823	1,365	1,342	1,293	1,423	1,446	1,444	1,447
Stock Change	(335)	(642)	(526)	(121)	215	242	350	(257)	(493)	(447)	(93)	171	186	278
TOTAL DISPOSITION	2,958	2,824	2,584	2,923	2,771	2,865	2,789	2,272	2,169	2,198	2,245	2,199	2,200	2,213
TOTAL INVENTORY	2,607	2,031	1,505	1,384	1,600	1,842	2,192	62,077	48,357	35,835	32,963	38,089	43,848	52,183
Last Year Inventory	2,934	2,261	1,731	1,651	1,767	2,042	2,233	69,856	53,842	41,218	39,303	42,066	48,630	53,164
Stock M/M Δ	(335)	(642)	(526)	(121)	215	242	350	(7,967)	(15,283)	(12,522)	(2,872)	5,126	5,758	8,336
Last Year Stock M/M Δ	(820)	(698)	(530)	(81)	116	275	192	(19,530)	(16,616)	(12,628)	(1,922)	2,760	6,541	4,560

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

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PADD AVERAGE HEATING DEGREE DAYS (HDD's)

Figure 10.1

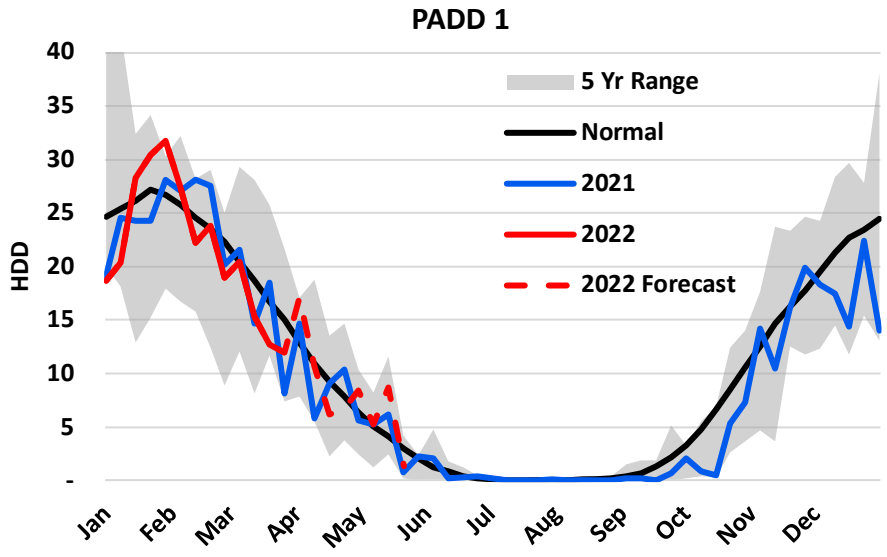


Figure 10.2

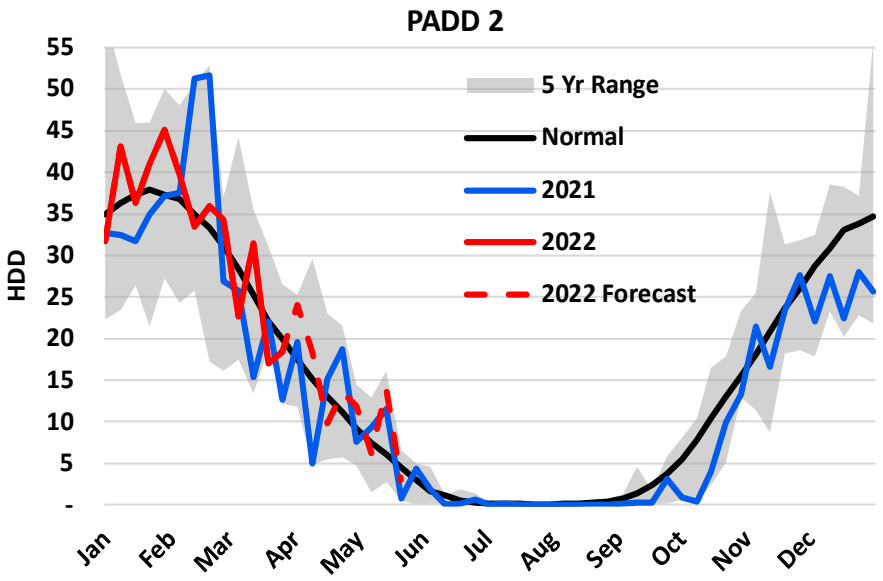
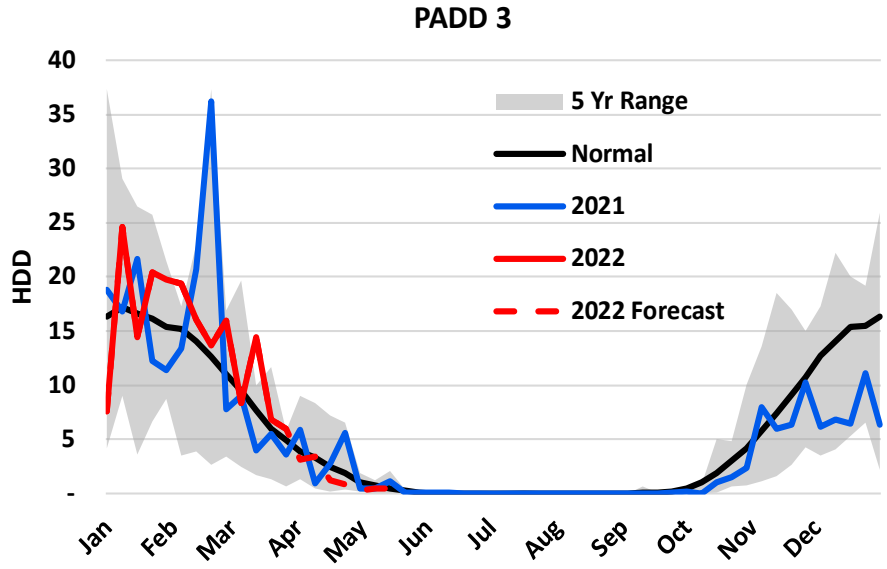


Figure 10.3



INSIGHTS & ANALYSIS

As shown in Figures 10.1-10.5, our weather data shows March HDD's were relatively unchanged from 2021 (up 4%) and the 5-year average (down 2%). As a result, Rescom demand for March was fairly flat with last year and the 5-year average. However, PADD 2 was much colder in March than last year, and the 5-year average, as reflected by the much larger inventory draw.

2021 – 2022 WINTER PROPANE SEASON RECAP

It was a warm start to the 2021 - 2022 winter heating season with total HDD's for 4Q 2021 down 12% from the prior season and 15% below the 5-year average. But January and February reversed the early warm trend with total HDD's coming in 12% and 8% above last year and the 5-year average, respectively. Overall HDD's for the 2021 -2022 winter propane season were only about 3% lower than last season and the 5-year average. Pretty uneventful based upon HDD data. But the real story of the 2021-2022 winter propane season was the timing and pattern of the cold weather. Clearly, the late start to winter was a big help for marketers. The other big boost was that the cold weather during this winter season was periodic artic blasts rather than sustained polar vortex type weather which allowed propane marketers to keep supply chains in decent shape.

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Figure 10.4

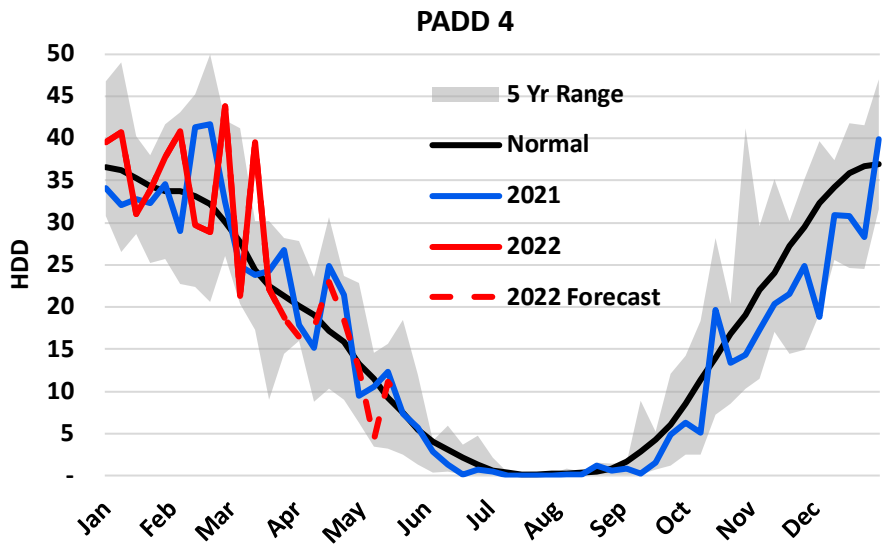
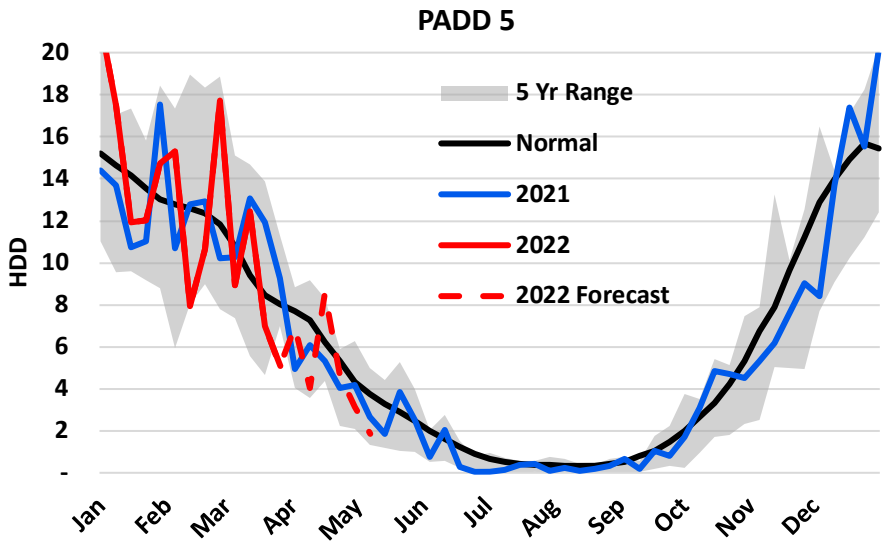


Figure 10.5



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