

Chemicals

Chem Weekly: Update on lithium pricing, US corn acres, crop chems, DOE projects

Industry Overview

UPL results highlight challenges in crop chemicals

On Friday, UPL, the #5 crop chemical producer globally (between Corteva and FMC) reported results for the December-ending F3Q24. Their volumes were down 5% y/y, slightly better than Corteva's -8% and significantly better than FMC's -21%. However, UPL's pricing in the quarter was down 24% (vs -7% and -4% for CTVA and FMC) due to more exposure to generic competition. CEO Mike Frank (formerly with Nutrien and Monsanto) highlighted on-going pricing pressure from Chinese producers that are operating at breakeven margins. Destocking pressures on volumes are not expected to normalize until 2H24, driven by inflated inventories of generic product and contributing to the pricing pressure. Note UPL produces the active ingredient chlorantranilaprole for FMC's Rynaxypyr, which UPL has recently launched in the US under their Shenzi brand. Corteva and FMC will be **presenting at our Florida conference on 2/28-29.**

DOE funds 4 large carbon capture projects

On Friday, the US Dept of Energy announced funding for 4 carbon capture projects, which we found notable for 2 key reasons. The first is the challenge/scale of these emission points from power plants, refinery cat cracker, and a pulp mill (see Exhibit 1). The CO2 emissions reduction is targeted at 500kmt, which DOE estimates as equivalent to 110k ICE cars. These industrial emission sources are quite challenging due to the low CO2 concentrations and high volumetric flow rates. Power generation and industrial emissions represent half of US CO2 emissions. The other notable feature of these project in our view is that these are largely novel technologies, developed by the Univ. of Kentucky, Research Triangle Institute, Svante, and TDA Research, highlighting the demand for innovation in decarbonization. Three members of the **DOE's Office of Technology Transitions will participate in panels at our Florida Conference.**

Lithium pricing particularly challenging in spodumene

Year-ago spot pricing for spodumene was \$6k/t, or ~10% of spot prices for lithium carbonate. This ratio dropped to 7% in May, 2023, and is currently 5% (\$850/t vs \$16k/t for carbonate). As with most commodities, as supply chains get long, the price pressure is magnified further upstream. Inventory levels of lithium carbonate in China at the end of December were the highest since 1H23. **We will discuss these fundamentals with Sigma Lithium on a webinar Monday 2/5 at 10amET.** Six lithium companies will also participate in our Florida Conference.

Initial '24 planting estimates – more corn than expected

Our discussions with market participants pointed to a 5 million acre shift from corn to soybeans this year. A recent survey from Farm Future showed 92.8mn acres of corn (-1.8mn y/y) and 85mn acres of beans (+1.4mn). Ag consultant Doane has also shifted its forecast towards corn with expectations of 91mn acres (-3.6mn y/y) and a similar shift in soybeans to 87.5mn acres. While various indicators continue to favor soybeans vs corn on a relative basis, December soybean prices have seen a sharper drop vs corn. And corn prices remain in contango (i.e., future prices are higher than current ones). Lastly, favorable weather led to a strong fall ammonia application season, locking in more corn.

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Exhibit 1: DOE funding for 4 large carbon capture projects

Projects include 2 power plants, one refinery, and a pulp mill

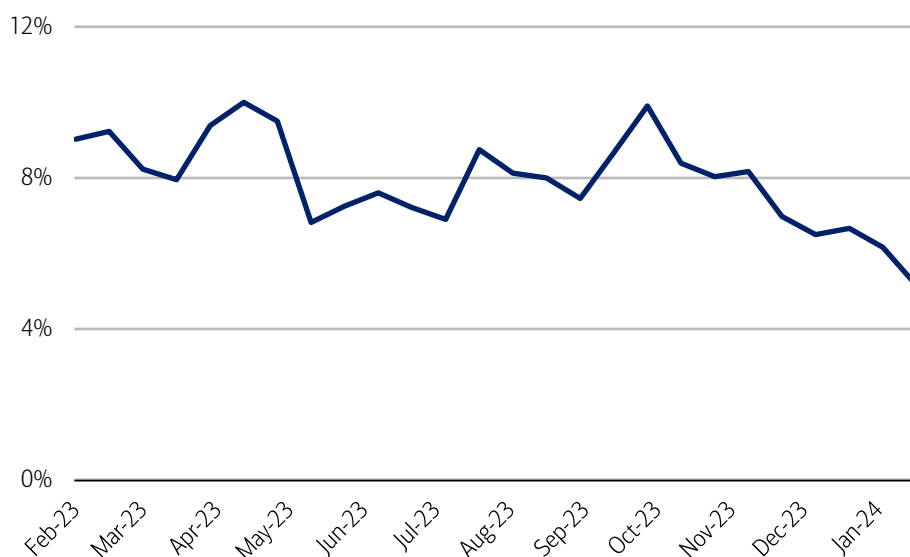
Facility type	Company	Location	Targeted CO2 capture	DOE funding	CO2 capture efficiency	Technology source	Capture technology	Fate of CO2
Power Plant	PPL	Kentucky	90,000mt	\$72mn	95%	Univ of Kentucky Center for Applied Energy Research	Heat-integrated CO2 capture - dual solvent	Beverages
Containerboard Mill	International Paper	Mississippi	120,000mt	\$88mn	90%	Research Triangle Institute	Solvent absorption	Sequestration
Refinery FCCU	Delek	Texas	145,000mt	\$95mn	90%	Svante	Solid sorbent using metal-organic frameworks desorbed with low-pressure steam	Sequestration
Power Plant	Basin Electric	Wyoming	158,000mt	\$49mn	90%	TDA Research in collaboration with SLB	Physical adsorbent	Sequestration

Source: DOE and company reports

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Exhibit 2: Australia Spodumene as a % of Asia (ex-China) Lithium Carbonate Price

Australia Spodumene is currently 5% of Asia (ex-China) Lithium Carbonate price



Source: Benchmark Minerals, BofA Global Research

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Petrochemical & Chlor-Alkali**Exhibit 3: Historical pricing overview for PE, PP, PVC, LNG, Isocyanates**

US ethane margins are currently higher than EU naphtha PE margins

	2018	2019	2020	2021	2022	2023	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Integrated PE Margins														
US Ethane	34	28	25	58	34	29	42	38	26	28	30	30	25	29
EU Naphtha	31	28	29	49	45	29	36	55	56	34	28	35	23	30
China Naphtha	17	5	11	2	-17	-11	-22	-17	-14	-16	-12	-6	-11	-13
Polyethylene Prices														
HDPE Net Transaction (NA c/lb)	62	52	49	85	69	54	74	78	65	61	55	54	53	54
HDPE Discounted Contract (EU c/lb)	74	66	60	91	87	75	91	100	79	76	77	75	71	75
HDPE Spot (Asia c/lb)	58	44	40	50	47	42	51	50	45	42	43	42	42	41
Ethylene Prices														
Ethylene (US Gulf c/lb)	20	19	19	45	29	20	38	30	25	21	23	19	19	21
Ethylene (EU c/lb)	50	42	27	53	51	35	60	65	40	40	42	32	30	35
Ethylene (SE Asia c/lb)	53	39	33	47	49	41	54	55	44	43	44	40	37	42

Ethylene Cash Costs

Exhibit 3: Historical pricing overview for PE, PP, PVC, LNG, Isocyanates

US ethane margins are currently higher than EU naphtha PE margins

	2018	2019	2020	2021	2022	2023	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
US Ethane (c/lb)	15	11	11	14	23	13	18	27	26	20	12	11	15	12
US Propane (c/lb)	23	13	13	23	32	19	39	34	32	25	20	18	20	16
US Naphtha (c/lb)	29	30	21	24	47	41	61	47	38	43	39	38	46	39
EU Naphtha (c/lb)	30	25	18	29	28	33	43	31	10	29	37	27	35	32
Asia Naphtha (c/lb)	35	33	21	40	53	43	64	55	46	47	45	37	43	46
US Butane (c/lb)	19	11	14	18	31	20	41	32	25	25	24	16	21	20

Feedstock Dynamics

US Ethane (c/gal)	33	22	19	31	48	25	39	57	55	39	25	21	29	23
US Propane (c/gal)	88	55	46	105	112	71	131	126	109	81	81	69	68	67
US Butane (c/gal)	92	59	53	117	125	80	159	134	111	96	108	67	61	85
Brent Oil (\$/bbl)	72	64	44	71	99	82	97	112	99	89	83	78	85	84

Isocyanates

US MDI (c/lb)	184	158	142	189	218	171	221	231	223	199	185	175	164	160
US TDI (c/lb)	162	155	220	267	234	263	230	224	227	254	272	270	260	251
EU MDI (Eur c/lb)	150	119	87	130	140	124	139	145	138	137	139	136	114	105
EU TDI (Eur c/lb)	89	112	154	140	100	136	83	80	86	152	173	153	114	106
China MDI (c/lb)	114	71	76	115	98	84	120	104	91	78	86	83	86	81
China TDI (c/lb)	83	116	191	170	85	101	85	80	74	99	114	102	96	90

Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 4: Historical pricing overview for PE, PP, PVC, LNG, Isocyanates

US ethane margins are currently higher than EU naphtha PE margins

	10/26	11/2	11/9	11/16	11/23	11/30	12/7	12/14	12/21	12/28	1/4	1/11	1/18	1/25	2/1
Integrated PE Margins															
US Ethane	30	30	30	31	32	32	27	28	28	28	31	29	29	31	30
EU Naphtha	33	32	32	32	32	32	25	25	25	25	23	23	23	23	27
China Naphtha	-13	-11	-10	-12	-12	-13	-14	-14	-18	-17	-14	-12	-14	-15	-18
Polyethylene Prices															
HDPE Net Transaction (NA c/lb)	56	56	56	56	56	56	51	51	51	51	54	54	54	54	54
HDPE Discounted Contract (EU c/lb)	76	75	75	75	75	75	74	74	74	74	74	74	74	74	75
HDPE Spot (Asia c/lb)	42	42	42	40	40	40	40	40	40	40	40	41	41	41	41
Ethylene Prices															
Ethylene (US Gulf c/lb)	22	22	21	19	21	21	20	19	18	18	19	20	20	20	21
Ethylene (EU c/lb)	36	34	34	34	34	34	34	34	34	34	33	33	33	33	45
Ethylene (SE Asia c/lb)	43	43	43	43	43	43	43	41	41	41	41	40	40	41	43
Ethylene Cash Costs															
US Ethane (c/lb)	13	13	13	12	11	11	11	10	10	10	10	12	12	10	11
US Propane (c/lb)	14	14	12	11	16	16	19	17	16	18	19	19	23	28	29
US Naphtha (c/lb)	41	39	36	36	39	40	40	36	38	38	37	37	35	39	41
EU Naphtha (c/lb)	29	30	30	30	30	30	35	35	35	35	38	38	38	38	35
Asia Naphtha (c/lb)	46	44	44	44	44	46	46	46	51	50	47	42	44	43	45
US Butane (c/lb)	13	15	14	15	20	21	29	30	28	29	28	25	26	30	27
Feedstock Dynamics															
US Ethane (c/gal)	26	25	26	23	21	21	21	17	20	17	18	21	24	19	20
US Propane (c/gal)	68	66	64	63	64	64	71	69	64	66	70	70	82	86	86
US Butane (c/gal)	78	79	82	84	85	83	96	104	99	96	101	93	96	102	95
Brent Oil (\$/bbl)	92	90	85	81	81	81	79	76	77	79	77	79	78	79	84
Isocyanates															
US MDI (c/lb)	160	160	160	160	160	160	160	160	160	160	160	160	160	170	160

Exhibit 4: Historical pricing overview for PE, PP, PVC, LNG, Isocyanates

US ethane margins are currently higher than EU naphtha PE margins

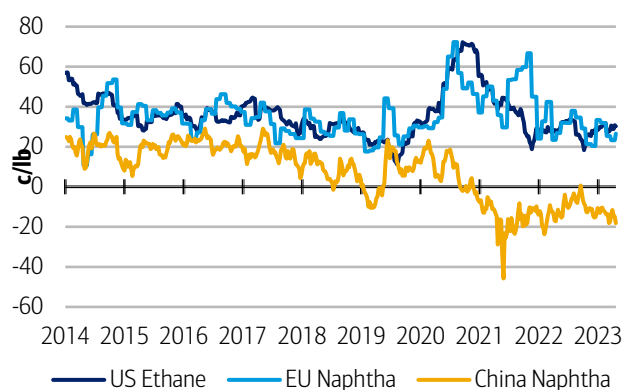
	10/26	11/2	11/9	11/16	11/23	11/30	12/7	12/14	12/21	12/28	1/4	1/11	1/18	1/25	2/1
US TDI (c/lb)	254	254	254	254	249	249	249	249	249	249	249	244	244	244	244
EU MDI (Eur c/lb)	99	99	100	109	109	110	108	110	110	111	111	111	112	112	112
EU TDI (Eur c/lb)	104	104	106	108	108	110	108	104	106	106	105	106	104	105	104
China MDI (c/lb)	78	81	81	82	81	81	81	81	81	81	81	81	81	82	83
China TDI (c/lb)	95	95	95	87	87	87	87	87	87	87	87	87	87	87	87

Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 5: Global PE Margins based on feedstock mix

Integrated margins remain negative for Chinese producers



Source: IHS, Bloomberg, BofA Global Research

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Exhibit 6: US premium to global netbacks

The US polyethylene price continues to have a premium to historic

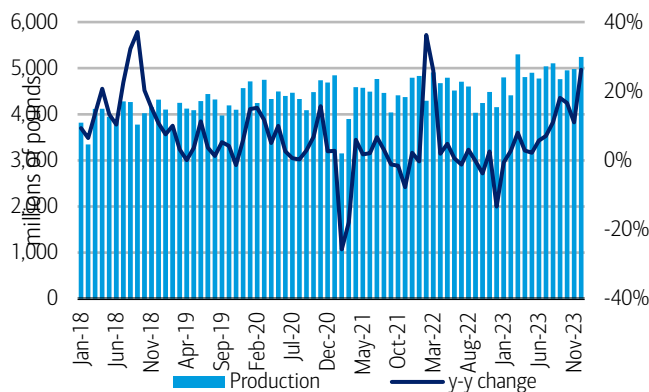


Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 7: US polyethylene production

Production is accelerating with new capacity

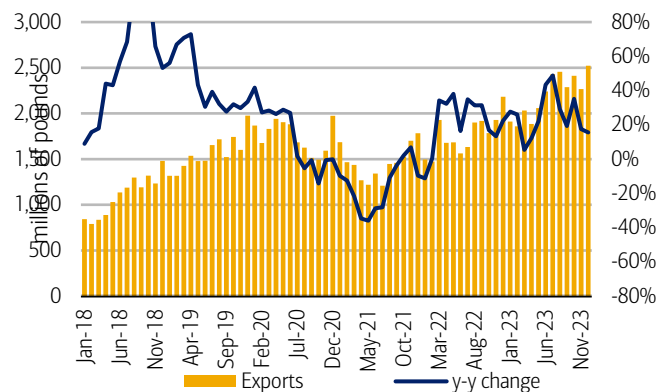


Source: American Chemistry Council, BofA Global Research

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Exhibit 8: US polyethylene exports

Exports have improved more recently

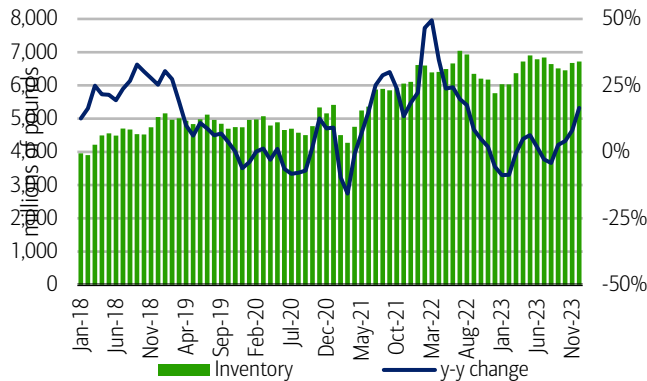


Source: American Chemistry Council, BofA Global Research

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Exhibit 9: US polyethylene inventory

Inventories remain elevated, returning to near peak levels

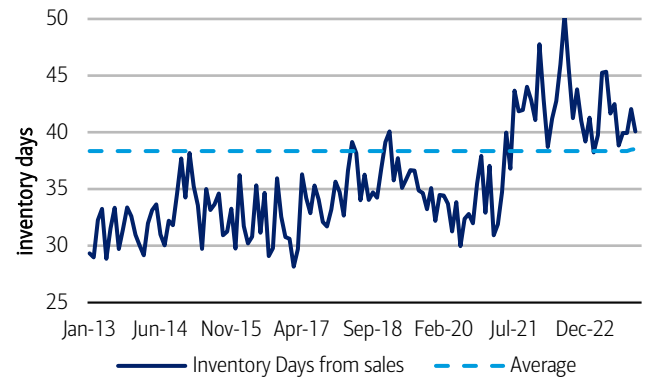


Source: American Chemistry Council, BofA Global Research

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Exhibit 10: US polyethylene days of sales in inventory

Days of sales in inventory are above normal

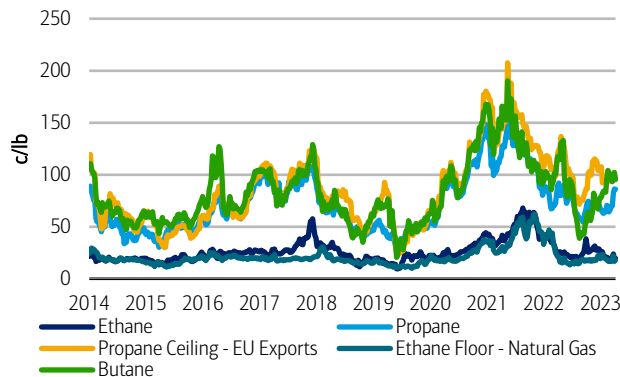


Source: American Chemistry Council, BofA Global Research

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Exhibit 11: US NGL Dynamics (c/lb)

US ethane is at the low end of the PE cost curve

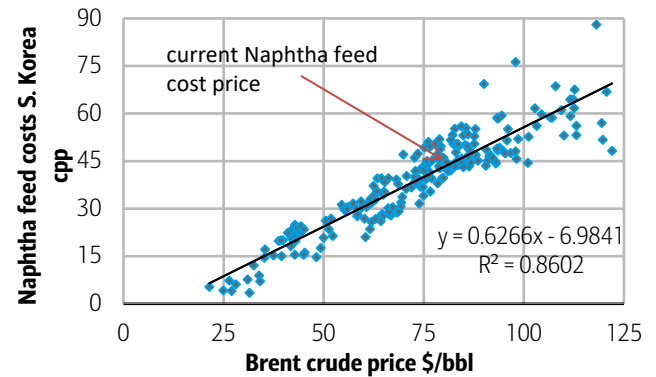


Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 12: Brent Oil vs Naphtha feed cost (S. Korea) price regression

Naphtha feedstock cost closely follow changes in Brent crude

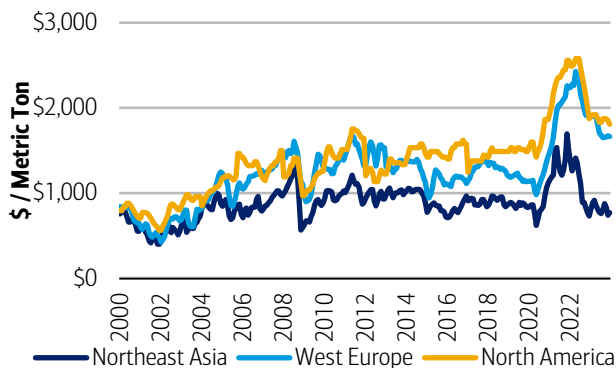


Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 13: PVC prices (\$/mt)

PVC prices moving off of multi-decade highs



Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 14: US Contract PVC Premium over Spot

Spot markets trade at a significant discount to contract

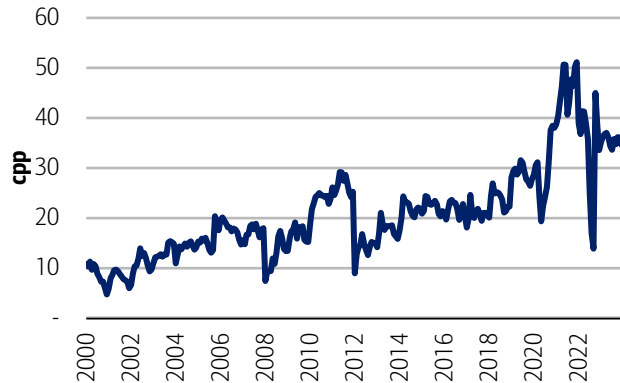


Source: OPIS, BofA Global Research Estimates

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Exhibit 15: non-integrated PVC margin (80% contract 20% spot)

PVC margins are moving off peak



Source: OPIS, Bloomberg, BofA Global Research Estimates

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Exhibit 16: US ethylene dichloride price

Prices have collapse with international PVC price

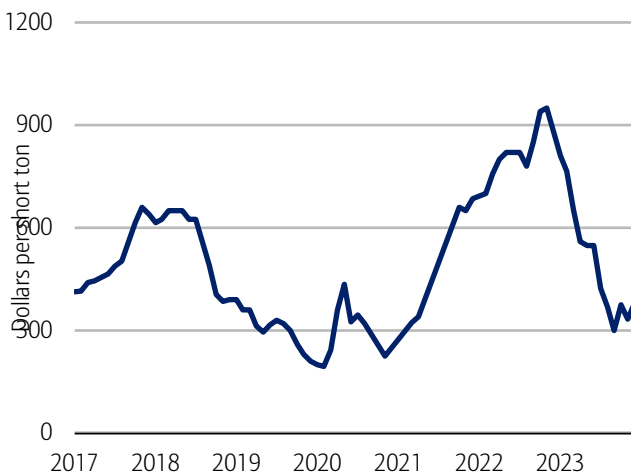


Source: Bloomberg, BofA Global Research

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Exhibit 17: Caustic export price (\$/ short ton)

At \$580/short ton caustic export prices have fallen off of highs

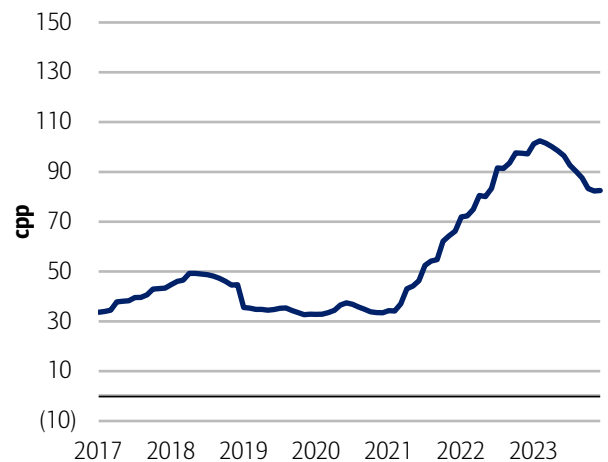


Source: Bloomberg

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Exhibit 18: US ECU Cash Margins

Cash margins remain high as cost deflation offset softer contract caustic

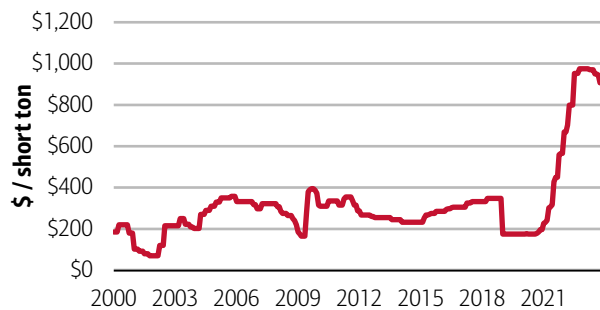


Source: Bloomberg, OPIS

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Exhibit 19: US chlorine price

Chlorine prices have moved higher on initiatives by Olin

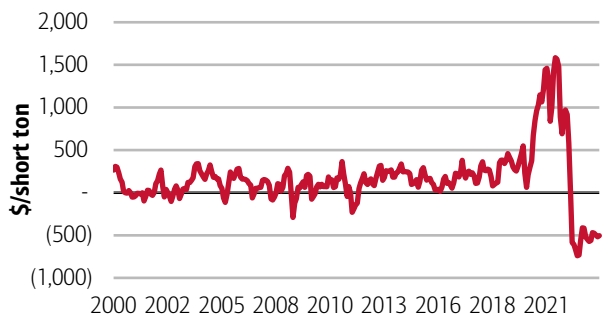


Source: OPIS

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Exhibit 20: Implied chlorine premium in spot PVC vs. merchant price

A negative value indicates an incentive to sell chlorine vs spot PVC

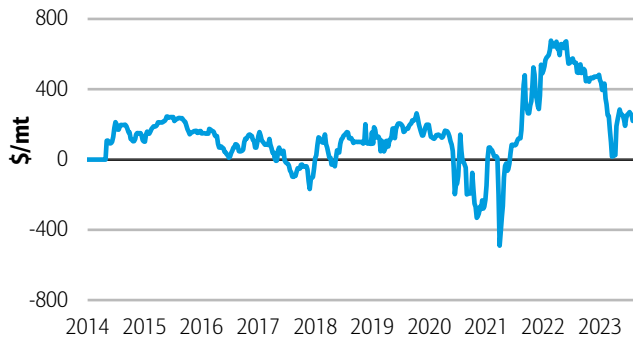


Source: OPIS, BofA Global Research

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Exhibit 21: US acetic acid spread to China

US acetic acid spread to china is near to zero

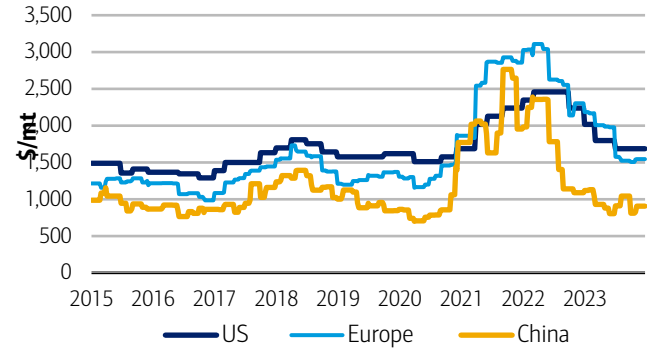


Source: Bloomberg, BofA Global Research

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Exhibit 22: Global VAM contract prices

US & European VAM prices remain bid

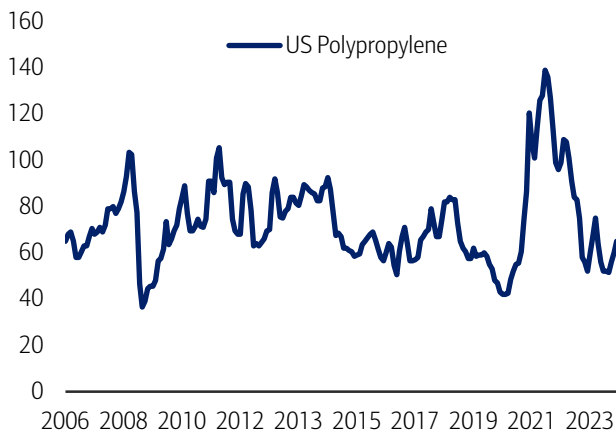


Source: Bloomberg

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Exhibit 23: US Polypropylene price

Polypropylene prices have retraced sharply

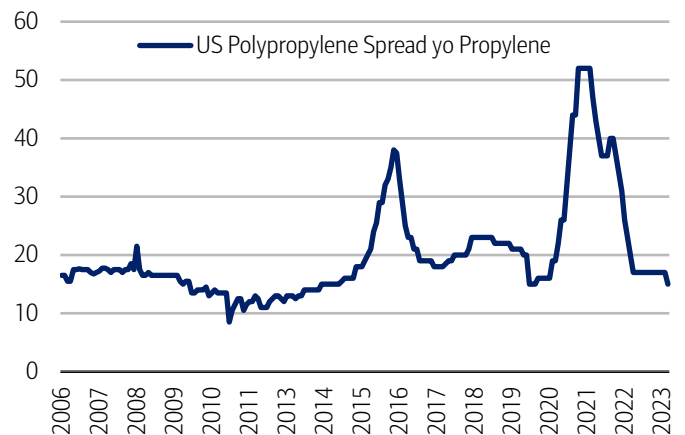


Source: OPIS

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Exhibit 24: Polypropylene spread to propylene

PP spread to monomer would seem to have more downside

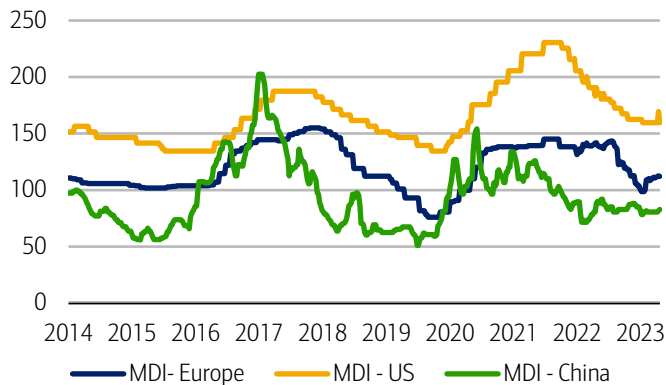


Source: OPIS and BofA Global Research

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Exhibit 25: Global polymeric MDI price deck

US remains at a healthy premium to global markets

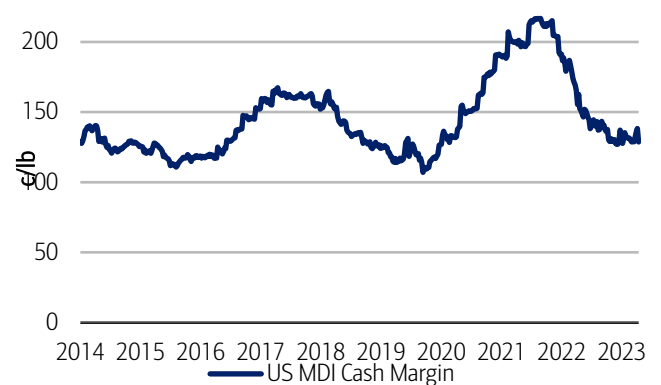


Source: ICIS

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Exhibit 26: US Polymeric MDI spread over raw material costs

US margins are off peak, but still at healthy levels

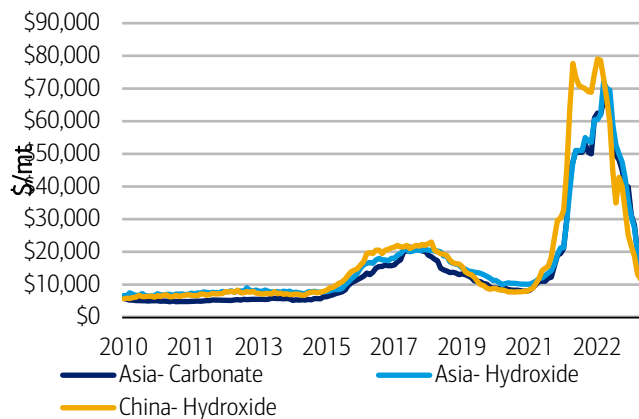


Source: ICIS, OPIS, BofA Global Research Estimates

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Exhibit 27: China and Asia (non-China) Prices

China prices continue to trade at a premium to other benchmarks



Source: Benchmark Minerals, BofA Global Research

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Exhibit 28: Premium of lithium hydroxide over carbonate

Hydroxide has historically carried a \$2,000/mt premium over carbonate



Source: Benchmark Minerals, BofA Global Research

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Nitrogen**Exhibit 29: Nitrogen pricing overview**

Nitrogen prices have started to decrease materially

	2018	2019	2020	2021	2022	2023		1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Nitrogen Prices															
Urea granular (US NOLA \$/st)	259	244	227	487	604	355		678	613	591	527	342	368	374	337
Urea granular (US Midwest \$/st)	297	302	272	529	670	435		752	679	633	610	421	466	428	424
Urea granular (Mediterranean \$/st)	265	252	237	503	691	365		800	703	682	567	386	317	393	363
Urea granular (SE Asia \$/st)	266	255	240	494	633	353		728	687	570	539	366	325	369	352
Ammonia (US Midwest \$/st)	422	401	327	735	1263	622		1367	1368	1063	1252	852	449	492	702
UAN (US Midwest \$/st)	211	202	160	368	562	300		602	614	482	551	351	285	268	295
Feedstock Costs															
Natural Gas (US HH \$/mmbtu)	3.07	2.53	2.12	3.70	6.49	2.66		4.53	7.39	7.78	6.01	2.71	2.35	2.65	2.92
Natural Gas (UK ICE \$/mmbtu)	7.89	4.86	3.30	15.81	31.84	12.65		32.03	21.98	41.54	31.09	16.30	10.24	10.58	13.48
Anthracite coal (China \$/mt)	139	131	131	164	212	182		237	221	200	194	204	179	183	162
	10/26	11/2	11/9	11/16	11/23	11/30	12/7	12/14	12/14	12/21	1/4	1/11	1/18	1/25	2/1
Nitrogen Prices															
Urea granular (US NOLA \$/st)	350	355	343	328	299	304	319	302	300	300	304	302	318	345	351
Urea granular (US Midwest \$/st)	410	413	425	425	425	425	398	385	398	398	380	380	385	395	400
Urea granular (Mediterranean \$/st)	399	379	375	363	340	332	321	329	312	312	322	327	347	364	384

Exhibit 29: Nitrogen pricing overview

Nitrogen prices have started to decrease materially

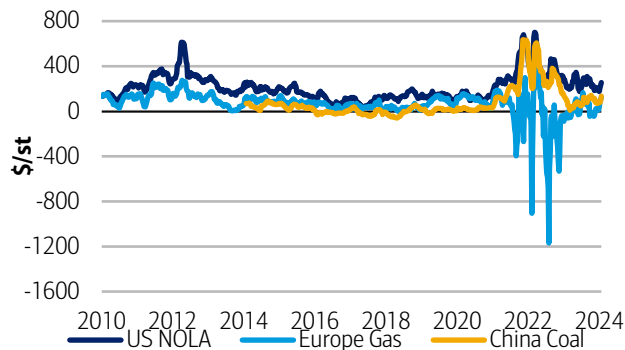
	2018	2019	2020	2021	2022	2023		1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Urea granular (SE Asia \$/st)	363	363	363	363	327	322	329	311	316	316	316	316	325	363	375
Ammonia (US Midwest \$/st)	750	750	725	725	725	725	725	600	600	600	600	600	600	600	600
UAN (US Midwest \$/st)	297	297	297	297	297	297	287	287	287	287	275	275	268	268	268
Feedstock Costs															
Natural Gas (US HH \$/mmbtu)	3.16	3.52	3.03	2.96	2.86	2.81	2.58	2.49	2.61	2.61	2.89	3.31	2.52	2.71	2.04
Natural Gas (UK ICE \$/mmbtu)	15.35	15.25	15.17	14.40	14.17	15.10	13.94	12.18	10.47	10.47	10.27	11.07	10.19	8.87	8.81
Anthracite coal (China \$/mt)	165	164	164	163	164	161	159	157	157	157	155	154	151	146	143

Source: CRU, Bloomberg, BofA Global Research

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Exhibit 30: Global Granular Urea Cash Margins (\$/st)

European urea margins are negative

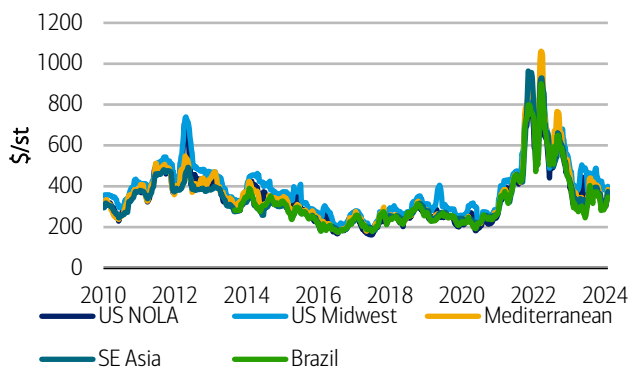


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 32: Global Granular Urea Prices (\$/st)

Prices have come off their recent highs

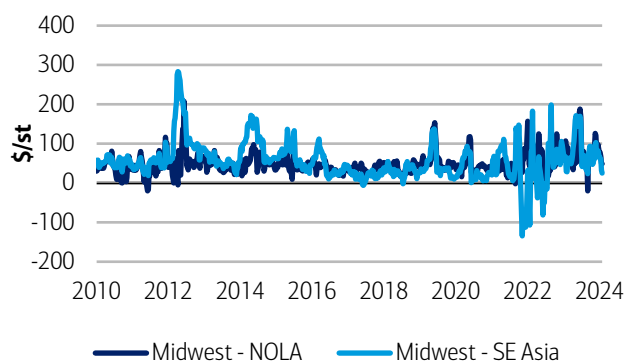


Source: CRU, Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 34: US Urea Price Differentials (\$/st)

US Midwest urea prices are above NOLA import price

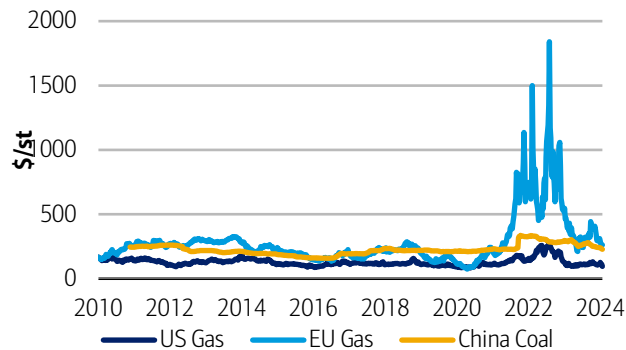


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 31: Global Granular Urea Cash Cost (\$/st)

US gas costs at bottom of cost curve

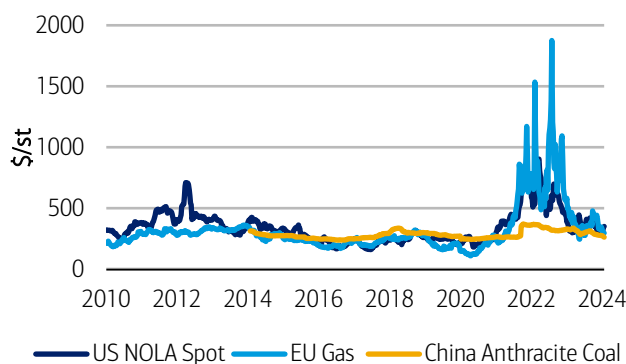


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 33: US NOLA Urea vs Delivered Costs (\$/st)

Product costs have fallen off their peak, but still remain elevated vs 2019 (pre-covid)

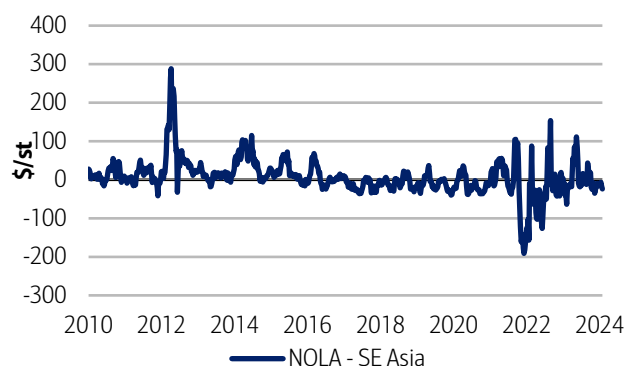


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 35: US NOLA - SE Asia Urea Price (\$/st)

US NOLA urea price is below Asia prices

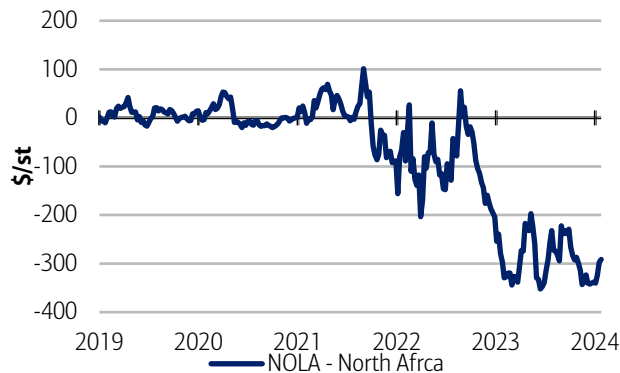


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 36: US NOLA - North Africa Urea Price (\$/st)

US NOLA urea price is now above North Africa prices

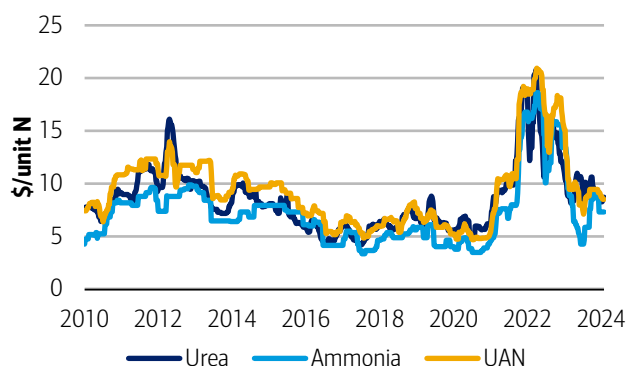


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 38: US Midwest Prices (\$/unit N)

Midwest UAN prices have surpassed urea on a unit N basis

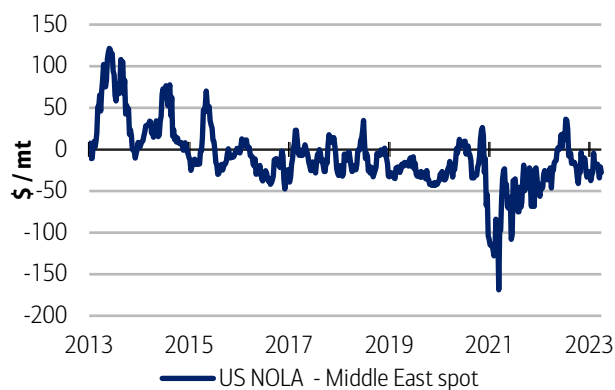


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 40: US NOLA implied vs. Middle East urea price spread

US NOLA urea price is now comparable to Middle East levels

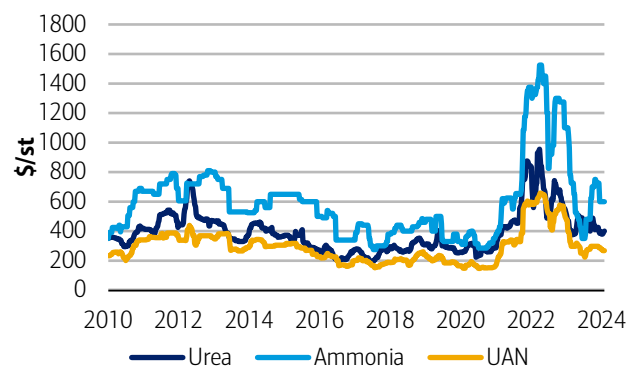


Source: CRU, BofA Global Research

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Exhibit 37: US Midwest Prices (\$/st)

All nitrogen fertilizer products have increased sharply

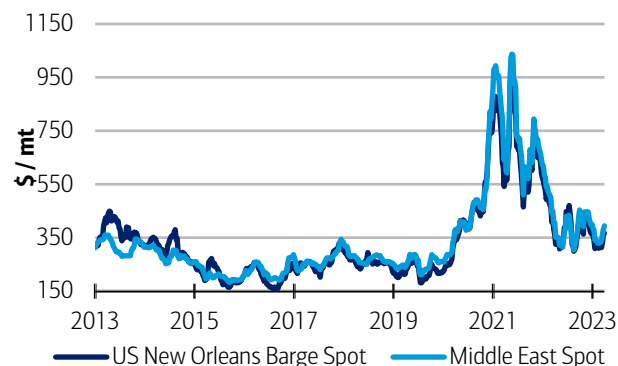


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 39: US NOLA implied vs. Middle East urea prices (\$/mt)

Prices have both fallen off their- peak, but still remain elevated vs 2019 (pre-covid)

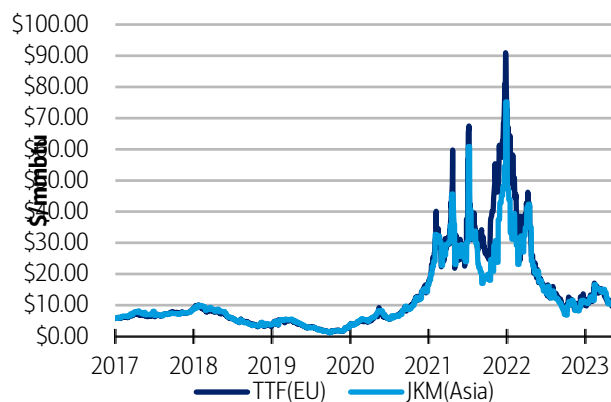


Source: CRU, BofA Global Research

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Exhibit 41: EU vs. Asia NatGas Prices (\$/mmBTU)

Asian nat gas prices are well below EU prices

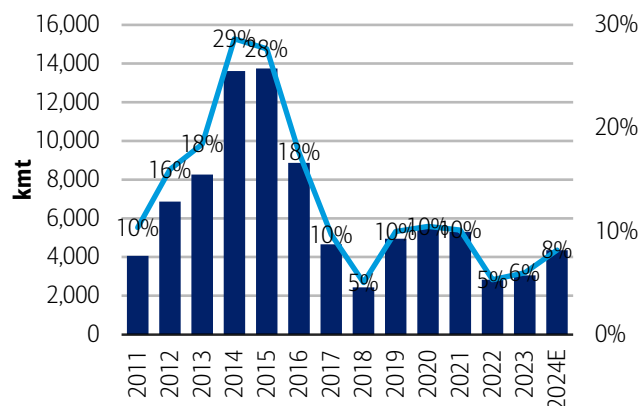


Source: Bloomberg, BofA Global Research

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Exhibit 42: Chinese Urea Exports & % of World Total

Chinese urea exports are well below prior peak levels

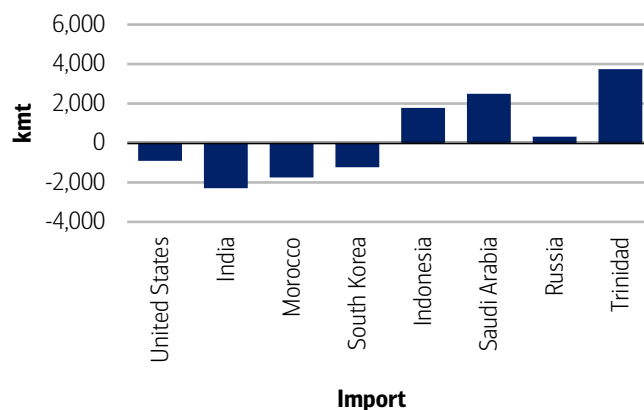


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 43: Global NH3 Trade Balance 2023

Trinidad is the largest ammonia exporter

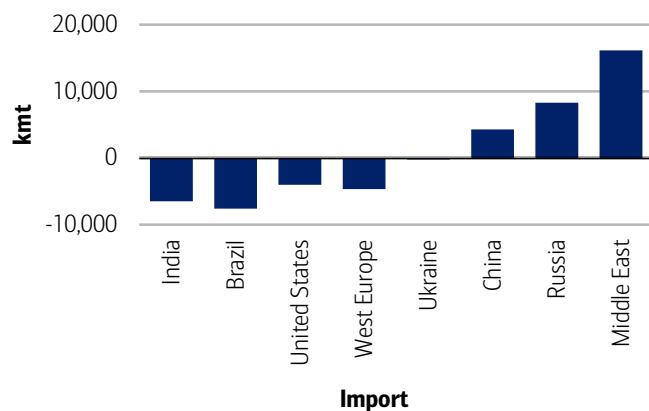


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 44: Global Urea Trade Balance 2023

Middle East is the largest urea exporter

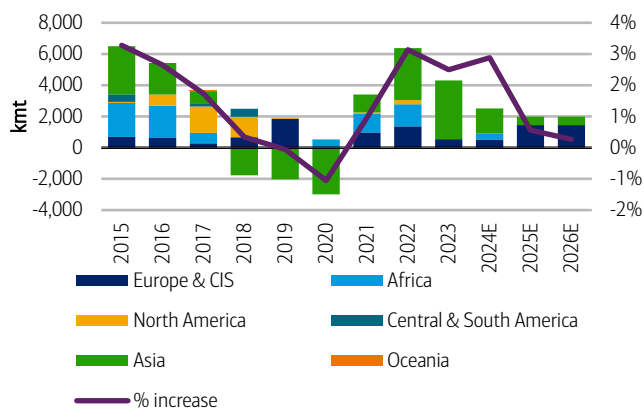


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 45: Global Urea Capacity additions by region

Global urea capacity additions are set to decrease from the 2022 peak

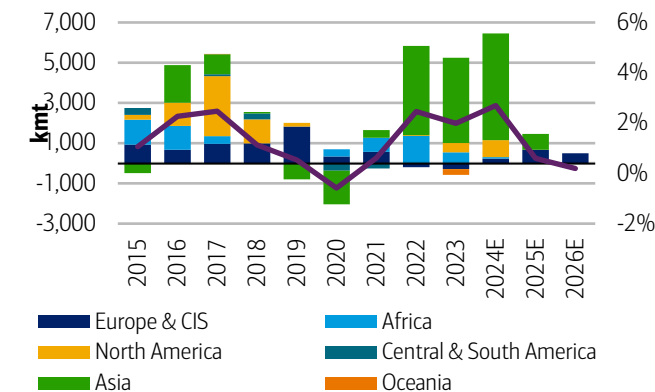


Source: BofA Global Research

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Exhibit 46: Global NH3 Capacity additions by region

New global ammonia coming in 2022

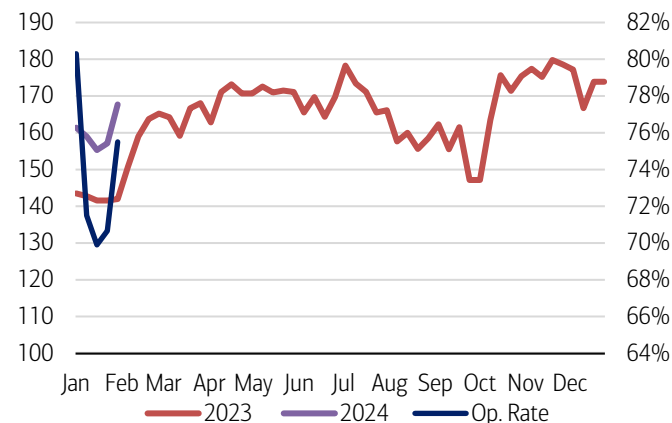


Source: CRU, BofA Global Research

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Exhibit 47: Chinese Urea Daily Production (weekly kmt)

China's urea production has dipped below year-ago levels

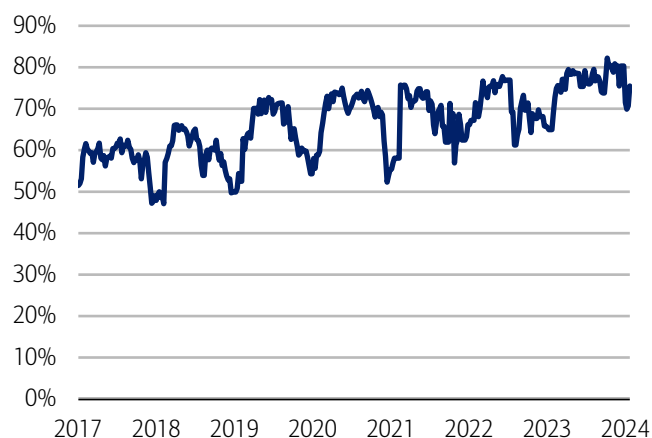


Source: CFMW, Bloomberg, BofA Global Research

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Exhibit 48: Chinese Urea Daily Production as a % of 5-yr max Daily production (weekly kmt)

China's urea production is seasonally strong

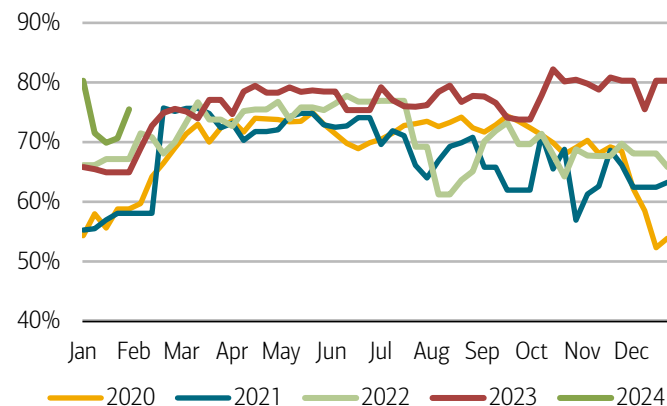


Source: CFMW, Bloomberg, BofA Global Research

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Exhibit 49: Chinese Urea Operating Rates

Operating rates have collapsed recently

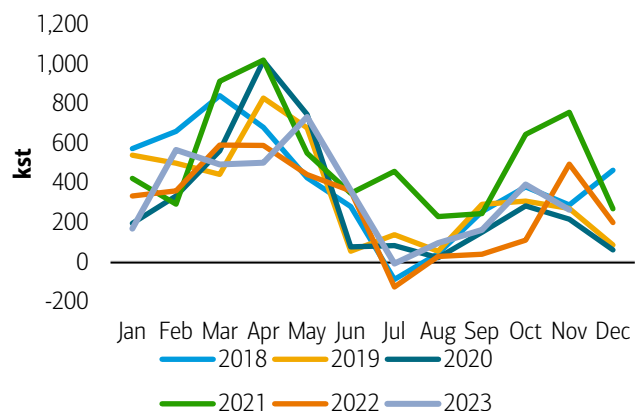


Source: CFMW, Bloomberg, BofA Global Research

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Exhibit 50: US Urea Net Imports (kst)

Net imports running at low levels year-to-date

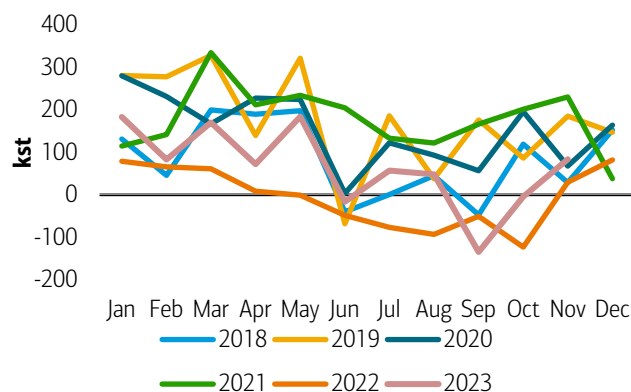


Source: TFI, Bloomberg, BofA Global Research

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Exhibit 51: US UAN net imports

UAN net imports are down sharply

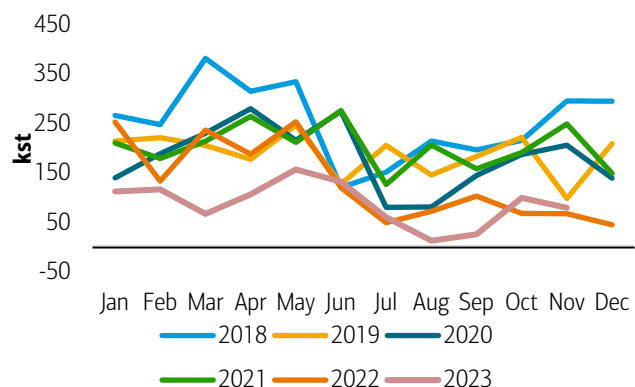


Source: TFI, Bloomberg, BofA Global Research

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Exhibit 52: US Ammonia net imports

The US is a net importer of ammonia all year



Source: TFI, Bloomberg, BofA Global Research

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Potash**Exhibit 53: Potash pricing overview**

Potash fertilizer prices have continued to rise

	2018	2019	2020	2021	2022	2023		1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Potash Prices															
Midwest Spot (\$/mt)	NM	NM	NM	NM	746	462		NM	856	794	648	493	494	427	439
Brazil Spot (\$/mt)	321	329	239	539	850	397		877	1115	844	565	495	399	345	346
Southeast Asia Spot (\$/mt)	278	294	245	400	778	372		706	930	854	620	472	386	309	318
Vancouver Spot (\$/mt)	280	295	230	441	789	374		806	971	794	583	475	367	326	322
China Contract (\$/mt)	246	290	242	245	564	419		484	590	590	590	590	477	307	307
India Contract (\$/mt)	256	288	248	297	579	421		545	590	590	590	551	422	382	319
	10/19	10/26	11/2	11/9	11/16	11/23	11/30	12/7	12/14	12/21	1/4	1/11	1/18	1/25	2/1
Potash Prices															
Midwest Spot (\$/mt)	419	439	444	441	446	446	446	446	446	446	439	422	408	406	408
Brazil Spot (\$/mt)	355	355	355	343	343	343	343	338	333	333	315	308	295	295	295
Southeast Asia Spot (\$/mt)	315	315	315	320	320	320	320	320	320	320	320	320	315	315	310
Vancouver Spot (\$/mt)	277	281	282	287	284	286	286	286	284	287	287	288	283	283	278
China Contract (\$/mt)	307	307	307	307	307	307	307	307	307	307	307	307	307	307	307
India Contract (\$/mt)	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319

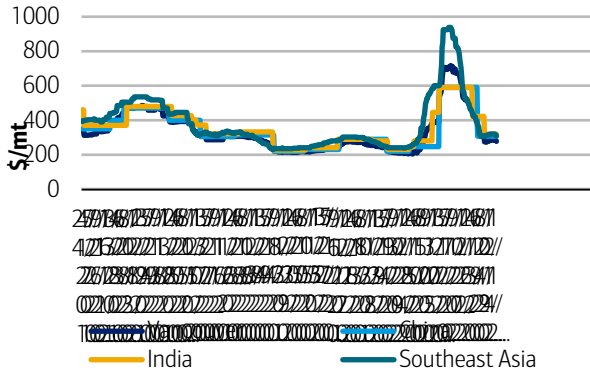
Source: CRU, Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH



Exhibit 54: Global Standard Potash Prices (\$/mt)

Standard potash prices have fallen from their recent peaks but still remain elevated vs 2019 (pre-covid)

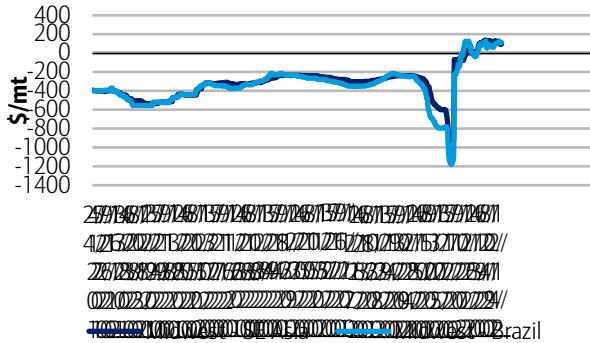


Source: CRU, Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 56: Potash Price Differentials (\$/mt)

US Midwest potash prices trade at a discount to global ones

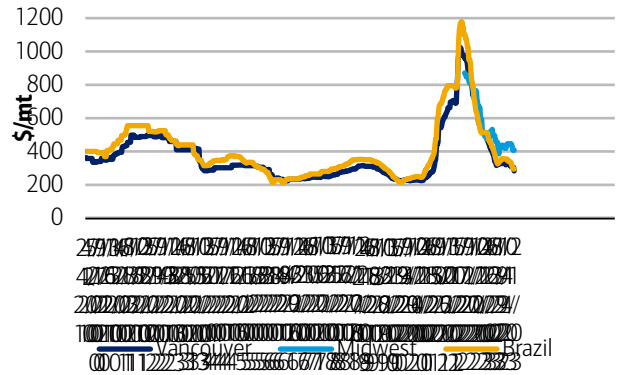


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 55: Global Granular Potash Prices (\$/mt)

Granular potash prices are off their highs

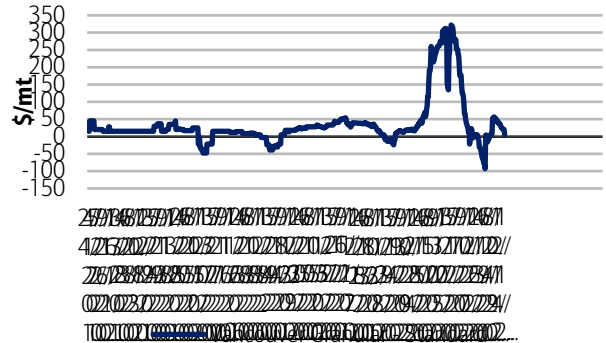


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 57: Granular Premium over Standard (\$/mt)

The granular premium over standard has recently reversed

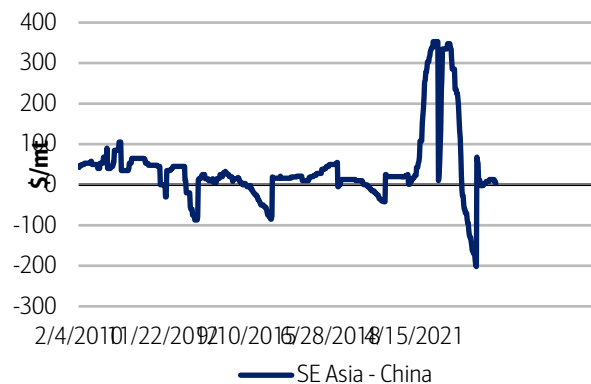


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 58: SE Asia Spot vs. China Contract (\$/mt)

SE Asia spot potash market is well above the contract price

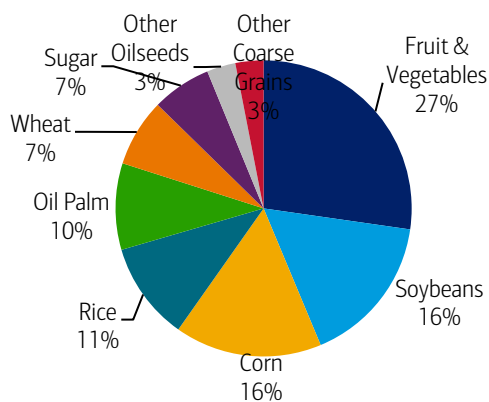


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 60: Global Potash Demand By Crop(2018)

Potash is used on all crops

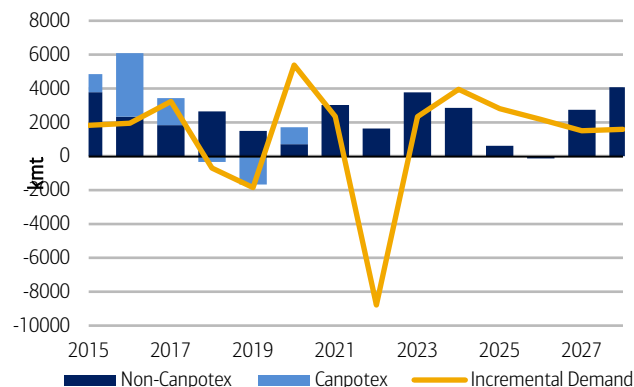


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 62: Global Capacity addition and demand growth

Most capacity additions were expected to come from Russia

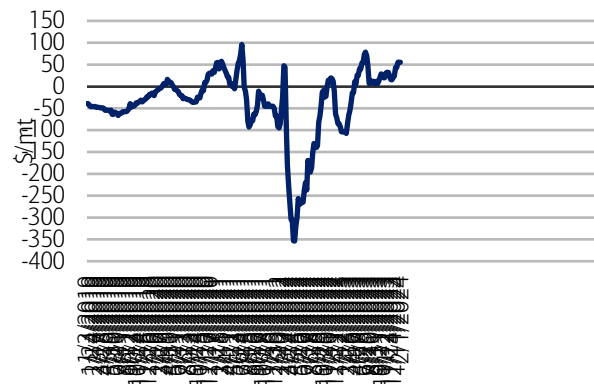


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 59: US NOLA vs. Brazil potash price spread

US NOLA urea price is now far below Brazil levels

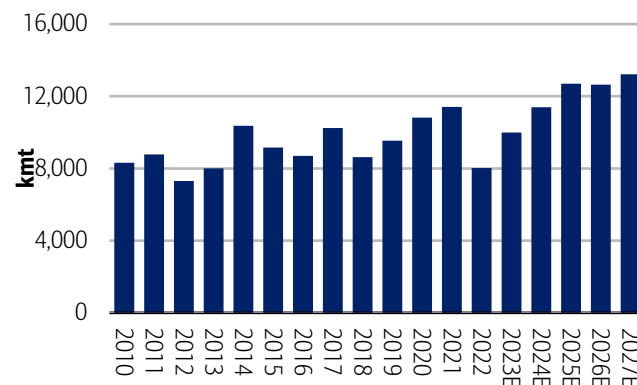


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 61: Russian Potash Exports (kmt)

Russia remains a large potash exporter

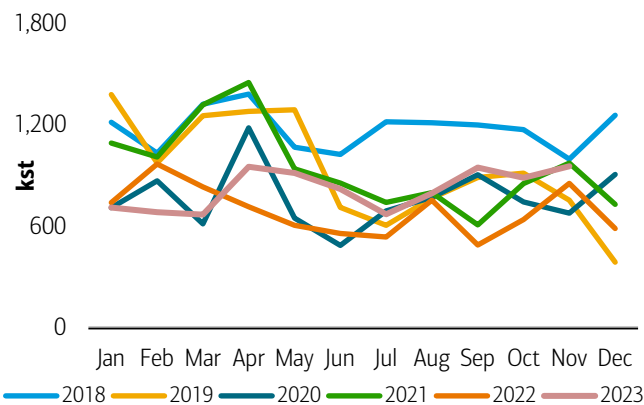


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 63: US MOP Net Imports

The US normally imports roughly 1mnt of potash per month

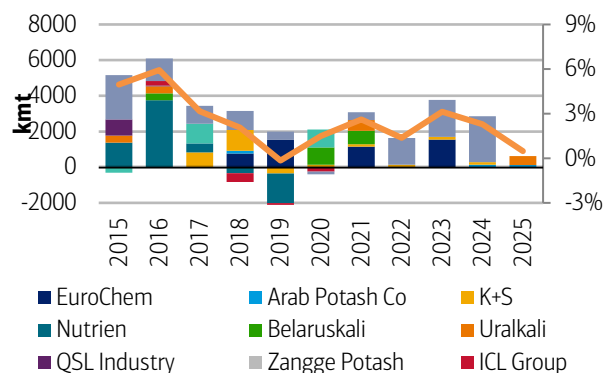


Source: TFI, Bloomberg, BofA Global Research

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Exhibit 64: Net Potash Capacity Addition by Company

Eurochem has significant Potash capacity to provide to the market

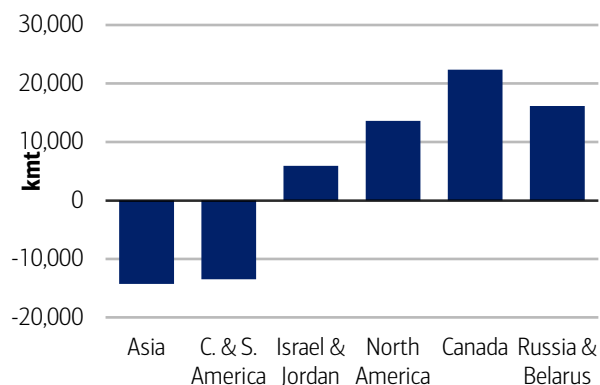


Source: CRU, BofA Global Research

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Exhibit 65: Global Potash Trade Flows

Canada & FSU are key potash supply regions



Source: CRU, BofA Global Research

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Phosphate**Exhibit 66: Historical pricing data for phosphate fertilizer**

Phosphate pricing is four-fold higher than mid-2020 levels

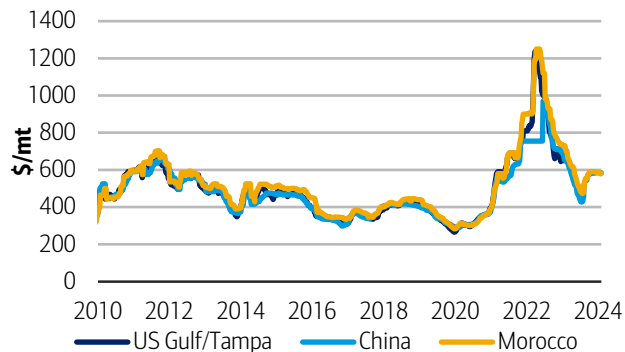
	2018	2019	2020	2021	2022	2023		1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Phosphate Prices															
DAP (US Midwest , \$/mt)	471	402	383	703	915	693		929	1000	889	836	740	743	622	663
DAP (US Gulf/Tampa, \$/mt)	419	344	323	641	899	560		950	1115	838	675	644	546	501	549
DAP - barge (New Orleans, \$/mt)	435	338	344	664	848	604		880	932	833	738	676	584	559	597
DAP (China, \$/mt)	435	338	344	664	848	604		880	932	833	738	676	584	559	597
DAP (Morocco, \$/mt)	412	348	322	592	780	557		755	805	846	710	636	503	507	583
MAP (US Gulf/Tampa, \$/mt)	429	361	322	651	969	589		979	1203	918	761	685	557	524	589
MAP - barge (New Orleans, \$/mt)	418	344	321	656	903	552		959	1114	845	675	641	525	497	545
MAP (Morocco, \$/mt)	444	340	354	703	872	632		907	967	869	736	638	568	643	683
MAP (Brazil, \$/mt)	427	361	325	675	970	574		1008	1195	935	723	668	553	514	561
Feedstock Costs															
Phosphate Rock (N. Africa, FOB, \$/mt)	91	95	90	133	270	255		194	270	322	298	297	285	215	219
Ammonia, (Tampa, CFR, \$/mt)	312	247	233	595	1162	513		1168	1272	1089	1116	744	369	343	604
Sulphur, (Tampa, FOB, \$/mt)	122	83	53	166	317	97		297	481	362	112	124	107	59	98
	10/19	10/26	11/2	11/9	11/16	11/23	11/30	12/7	12/14	12/21	1/4	1/11	1/18	1/25	2/1
Phosphate Prices															
DAP (US Midwest , \$/mt)	656	661	661	650	650	650	650	694	694	678	714	758	742	742	742
DAP (US Gulf/Tampa, \$/mt)	543	543	550	550	550	550	550	550	560	560	560	560	560	560	560
DAP - barge (New Orleans, \$/mt)	588	593	588	582	590	601	599	615	623	623	643	665	659	657	648
DAP (Morocco, \$/mt)	590	590	590	590	590	590	590	590	585	585	585	585	585	578	580
MAP (US Gulf/Tampa, \$/mt)	538	538	545	545	545	545	545	545	560	560	560	560	560	560	560
MAP - barge (New Orleans, \$/mt)	711	683	692	698	659	650	661	665	672	678	689	694	694	689	694
MAP (Morocco, \$/mt)	543	543	545	548	573	578	578	578	578	578	578	578	578	578	578
MAP (Brazil, \$/mt)	550	550	555	558	560	563	563	563	563	563	563	563	563	563	560
Feedstock Costs															
Phosphate Rock (N. Africa, FOB, \$/mt)	215	215	215	220	220	220	220	220	220	220	220	220	220	220	220
Ammonia, (Tampa, CFR, \$/mt)	575	625	625	625	625	625	625	625	625	525	525	525	525	445	445
Sulphur, (Tampa, FOB, \$/mt)	102	102	102	102	102	102	102	102	102	102	102	69	69	69	69

Source: CRU, Bloomberg, BofA Global Research

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Exhibit 67: Global DAP Prices

DAP prices globally are up sharply

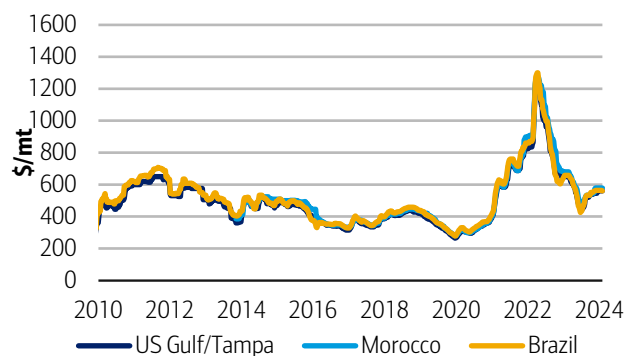


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 68: US MAP Prices (\$/mt)

Morocco currently has the highest MAP prices

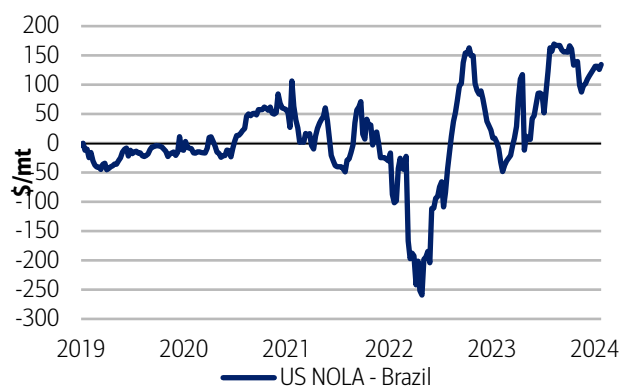


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 69: US NOLA vs Brazil phosphate price spread

US NOLA phosphate prices is above Brazil levels

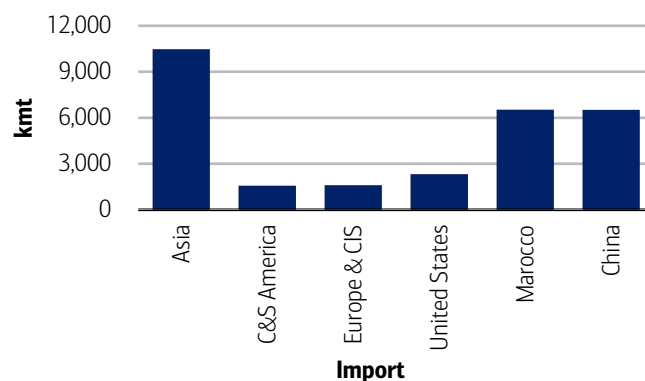


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 70: Global Phosphate Trade Flows 2023

China is the largest phosphate importer

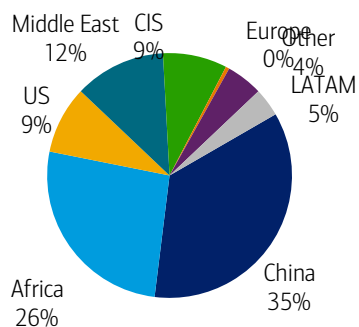


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 71: Phosphate Rock Production by Region

China is the largest phosphate rock supplier



Source: CRU, Bloomberg, BofA Global Research

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