

Chemicals

Chem Weekly: Updates on fertilizer/seed, petchem pricing, and coatings raws

Industry Overview

Early spring could tighten fertilizer markets

We met with 12 farmer cooperatives in Iowa last Tuesday to discuss Ag fundamentals for 2024 and one striking takeaway for us was how early field activity has started this year. Ammonia applications were already underway in Iowa, **a month earlier than normal**, due to dry soils and above-average temperatures, which could be the case in multiple regions (see Exh 1-2). We expect the early spring to lead to strong Q1 seed sales for Corteva and a tighter US market for nitrogen and phosphate, consistent with comments from the fertilizer panel at our Florida conference ([takeaways here](#)). The early spring means the window for US fertilizer imports is now closed, and combined with well below normal urea imports for the last 8 months, we believe channel inventory levels are tight, and thus we expect further price increases in coming months. US Cornbelt urea prices are near \$500/st vs near \$400/st at NOLA, representing a wider than normal spread. US DAP prices at NOLA have continued to rally and now nearly \$700/st. We expect pricing for both nutrients to remain strong near-term, as China's urea and DAP exports will not begin until May. We do not expect a recovery in potash pricing unless demand is above-normal to offset undisciplined FSU shipments.

Commodity chems updates: polymers, acetyls, epoxies

Pricing for commodity chemicals continued to move higher in February, despite continued soft end-market demand, due to a combination of supply tightness (e.g., Red Sea impact) and a recovery in customer purchases due to lean inventories. In the US domestic contract prices of polyethylene (PE) were flat despite 5cpp nominations, which have now rolled over as 3cpp hike proposals for March; this was in line with our expectations given the earlier-than-expected price hike achieved in January. According to CMA, Shell is also now running its third PE unit which went offline shortly after the plant's start-up a year ago. Yet the export pull continued to drive spot prices higher, with domestic benchmarks up 3.5-4cpp and export up over 6cpp. Since their December lows, spot domestic and export prices are up by ~3.5-5.5cpp and ~10cpp, respectively. Internationally, there was little traction in China, but European prices did move up as expected by over €100/tonne with more expected in March. This big step-up erased all price declines seen since March 2023. The domestic polypropylene (PP) market remained subdued with a 4cpp increase simply reflecting the monomer change, but European supplies are under pressure and margins increased by over €100/tonne to ~€150. While this level is still subdued relative to historical profitability, PP margins in Europe are now solidly in the green and at their highest level in two years. In PVC, demand was subdued in Asia, but pre-buying in the US/Europe led the US contract and spot prices up 3cpp each.

Continued in the next page

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Timestamp: 10 March 2024 11:44PM EDT

10 March 2024

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Abbreviations:

NOLA: New Orleans

DAP: Diammonium phosphate

St: Short ton

CMA: Chemical Market Analytics

Cpp: Cents per pound

PVC: Polyvinyl chloride

VAM: Vinyl acetate monomer

MMA: Methyl methacrylate

BPA: Bisphenol A

HDPE: High density polyethylene

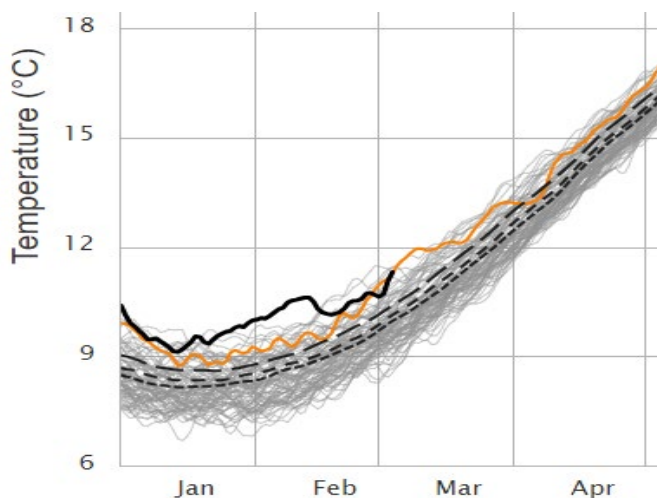
Chinese spot acetic acid prices have been drifting lower over the past month on soft demand in most Asian markets, although another US Force Majeure could help tighten the market. ICIS reported that LyondellBasell declared FM on acetic acid and VAM for March following a fire at its LaPorte, TX plant. The company's acid plant comprises almost 20% of US capacity. Meanwhile, ICIS noted that European epoxy price discusses for March have kicked off with the market looking at €100-200/tonne of increases, although largely to offset increased benzene costs – which increased by over €200/tonne for a second straight month.. Asian producers are also trying to raise prices (before the impact of freight costs) to offset feedstock inflation.

Coatings aggregator sees faster moderation in deflation

We updated our coatings raw material aggregator, based on OPIS forecasts, the crude forward curve, and our own estimates, reflecting low level deflation turning into reinflation by 1Q25. This moderating deflation trend throughout 2024 is driven primarily by higher Epoxy, TiO₂, and tin pricing, all of which we expect to increase throughout 2024 based on rising BPA price expectations, internal estimates in all regions, and internal can sheet body price estimates from our packaging team (see Exh 3). European TiO₂ pricing is the clear driver of moderating deflation/reinflation for our aggregator. We also note our expectations of some modest inflation in HDPE pricing, despite falling crude oil futures, and we note that an increase in propylene monomer pricing drives some 2H inflation in our estimates for Acrylic and MMA pricing, further offsetting what was previously a higher level of deflation (although much of this 2H inflation will not be recognized by coatings producers until 1H25 due to the lag of inventory to flow through to COGS). All in, coatings companies will likely see low to mid-single-digit raw material cost deflation in 1Q24, slowly moderating to a flat 4Q24, implying 1-2% deflation for 2024. This flatness in 4Q24 could turn into reinflation by 1Q25. We note that inflation for coatings companies has outpaced our coatings cost aggregator forecasts (Exhibits 4-5), because of spot buying, and logistics/labor inflation. Some of this may “come back to companies as supply chains normalize, though other “non-raw material” costs remain sticky.

Exhibit 1: Northern Hemisphere daily temperatures, 85 years

Record temperatures for much of February

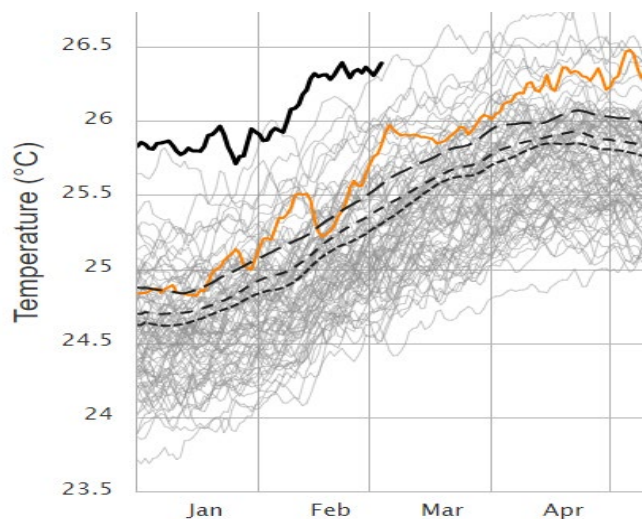


Source: Climate Change Institute, University of Maine

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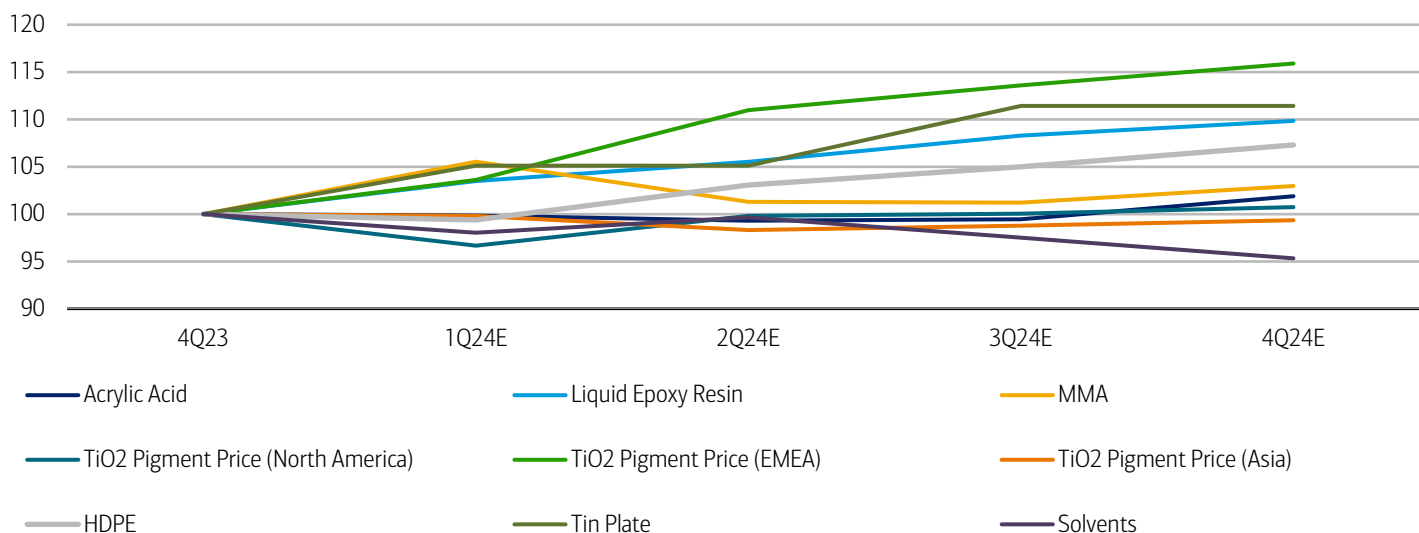
Exhibit 2: Tropical region daily temperatures, 85 years

Continued record temperatures



Source: Climate Change Institute, University of Maine

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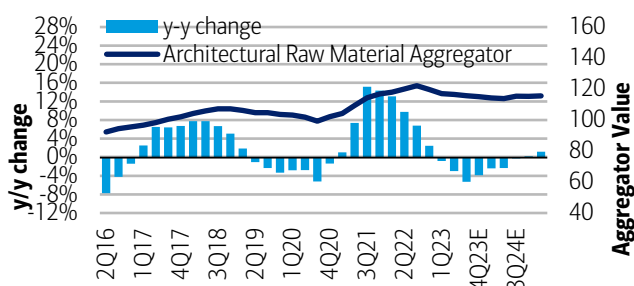
Exhibit 3: Select Input Commodity Prices Since 4Q23 (Indexed to 100)European TiO₂, Tin Plate, and Liquid Epoxy Resin drive the most inflationary pressure in our aggregator

Source: OPIS, ICIS, TZMI, Bloomberg, BofA Global Research estimates

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Exhibit 4: Architectural Coatings Raw Material Aggregator

Raw material prices are expected to deflate 1.2% in 2024, inflecting to slight reflation in 1Q25

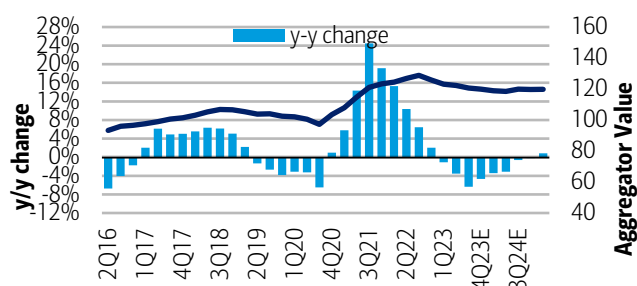


Source: OPIS, ICIS, TZMI, Bloomberg, BofA Global Research estimates

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Exhibit 5: Industrial Coatings Raw Material Aggregator

Raw material prices are expected to deflate 1.8% in 2024, inflecting to slight reflation in 1Q25



Source: OPIS, ICIS, TZMI, Bloomberg, BofA Global Research estimates

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Petrochemical & Chlor-Alkali**Exhibit 6: 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



Exhibit 6: 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
Ethylene Cash Costs														
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)	164	152	212	269	232	263	239	223	227	240	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)	90	107	152	146	93	136	88	79	84	119	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)	87	106	188	182	83	101	88	84	75	85	114	102	96	90

Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 7: Historical pricing overview for PE, PP, PVC, LNG, Isocyanates

US ethane margins are currently higher than EU naphtha PE margins

	11/30	12/7	12/14	12/21	12/28	1/4	1/11	1/18	1/25	2/1	2/8	2/15	2/22	2/29	3/7
Integrated PE Margins															
US Ethane	32	27	28	28	28	31	29	29	31	30	30	31	31	31	31
EU Naphtha	32	25	25	25	25	23	23	23	23	29	29	29	29	29	36
China Naphtha	-13	-14	-14	-18	-17	-14	-11	-14	-15	-18	-11	-15	-13	-14	-15
Polyethylene Prices															
HDPE Net Transaction (NA c/lb)	56	51	51	51	51	54	54	54	54	54	54	54	54	54	54
HDPE Discounted Contract (EU c/lb)	75	74	74	74	74	74	74	74	74	80	80	80	80	80	82
HDPE Spot (Asia c/lb)	40	40	40	40	40	40	41	41	41	41	41	41	41	41	42
Ethylene Prices															
Ethylene (US Gulf c/lb)	21	20	19	18	18	19	20	20	20	21	20	20	19	19	19
Ethylene (EU c/lb)	34	34	34	34	34	33	33	33	33	38	38	38	38	38	37
Ethylene (SE Asia c/lb)	43	43	41	41	41	41	40	40	41	43	43	43	43	49	49
Ethylene Cash Costs															
US Ethane (c/lb)	11	11	10	10	10	10	12	12	10	11	11	10	10	10	10
US Propane (c/lb)	16	19	17	16	18	18	19	23	27	27	29	27	25	22	19
US Naphtha (c/lb)	40	40	36	38	38	37	36	34	38	38	34	37	36	36	35
EU Naphtha (c/lb)	30	35	35	35	35	38	38	38	38	37	37	37	37	37	33
Asia Naphtha (c/lb)	46	46	46	51	50	47	42	44	42	44	40	45	43	42	43
US Butane (c/lb)	21	28	30	28	29	28	25	25	29	26	26	26	25	23	18
Feedstock Dynamics															
US Ethane (c/gal)	21	21	17	20	17	18	21	24	19	20	21	19	17	19	20
US Propane (c/gal)	64	71	69	64	66	70	70	82	86	86	92	92	92	86	86
US Butane (c/gal)	83	96	104	99	96	101	93	96	102	95	96	100	95	87	84
Brent Oil (\$/bbl)	81	79	76	77	79	77	79	78	79	84	77	82	83	82	84
Isocyanates															

Exhibit 7: Historical pricing overview for PE, PP, PVC, LNG, Isocyanates

US ethane margins are currently higher than EU naphtha PE margins

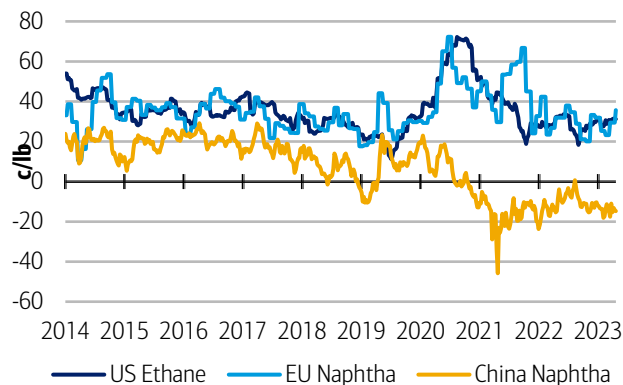
	11/30	12/7	12/14	12/21	12/28	1/4	1/11	1/18	1/25	2/1	2/8	2/15	2/22	2/29	3/7
US MDI (c/lb)	160	160	160	160	160	160	160	160	170	160	160	160	160	160	160
US TDI (c/lb)	249	249	249	249	249	249	244	244	244	244	244	244	244	244	244
EU MDI (Eur c/lb)	110	108	110	110	111	111	111	112	112	112	111	113	114	114	115
EU TDI (Eur c/lb)	110	108	104	106	106	105	106	104	105	104	103	103	104	104	105
China MDI (c/lb)	81	81	81	81	81	81	81	81	82	83	83	83	90	90	90
China TDI (c/lb)	87	87	87	87	87	87	87	87	87	87	90	90	90	92	94

Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 8: 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 9: US premium to global netbacks

The US polyethylene price continues to have a premium to historic

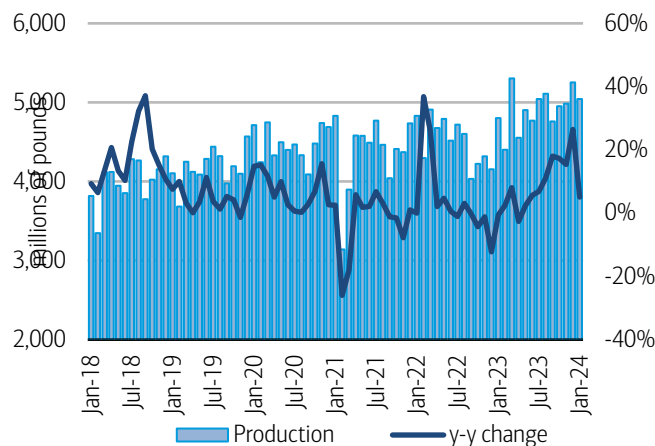


Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 10: US polyethylene production

Production is accelerating with new capacity

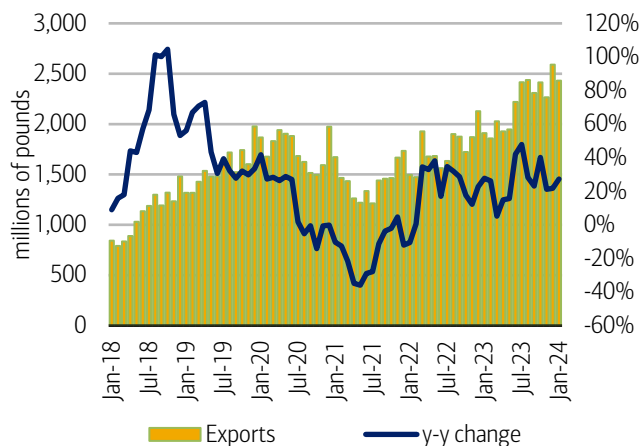


Source: American Chemistry Council, BofA Global Research

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Exhibit 11: US polyethylene exports

Exports have improved more recently

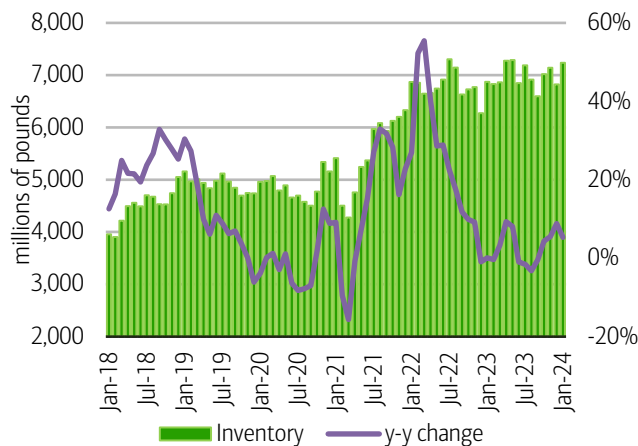


Source: American Chemistry Council, BofA Global Research

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Exhibit 12: US polyethylene inventory

Inventories remain elevated, returning to near peak levels

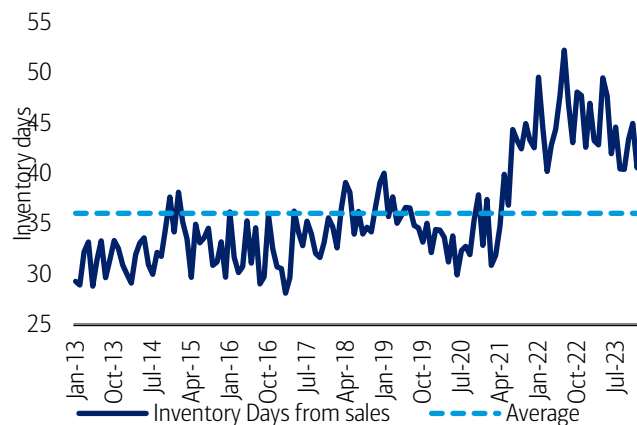


Source: American Chemistry Council, BofA Global Research

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Exhibit 13: US polyethylene days of sales in inventory

Days of sales in inventory are above normal

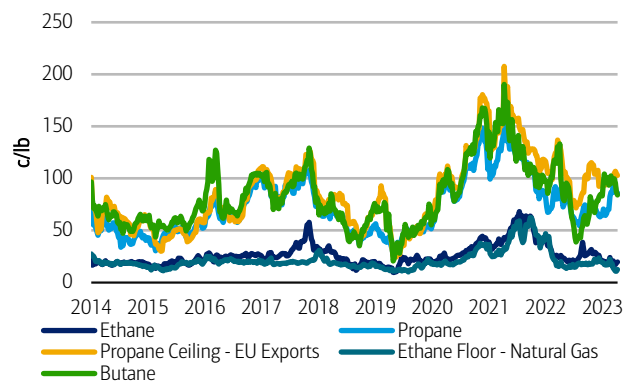


Source: American Chemistry Council, BofA Global Research

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Exhibit 14: US NGL Dynamics (c/lb)

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

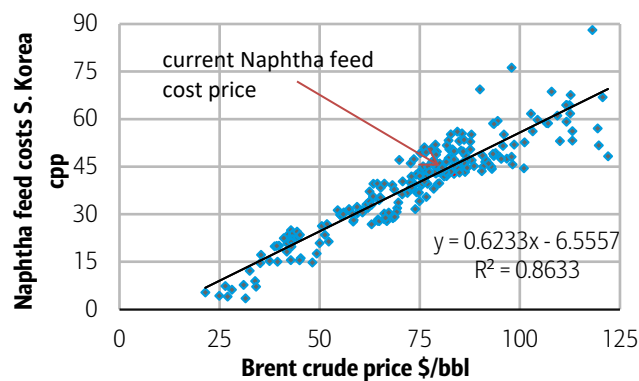


Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 15: Brent Oil vs Naphtha feed cost (S. Korea) price regression

Naphtha feedstock cost closely follow changes in Brent crude

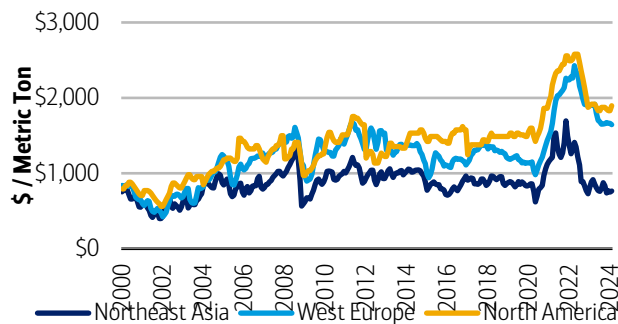


Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 16: PVC prices (\$/mt)

PVC prices moving off of multi-decade highs

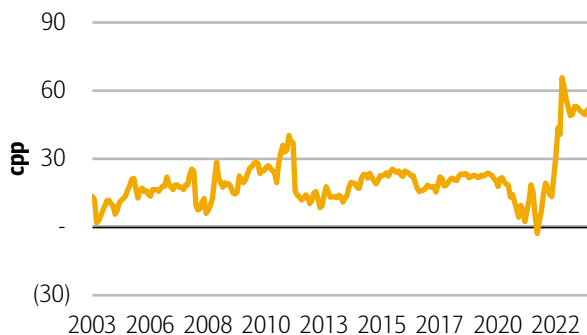


Source: OPIS, Bloomberg, BofA Global Research

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Exhibit 17: 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 18: non-integrated PVC margin (80% contract 20% spot)

PVC margins are moving off peak

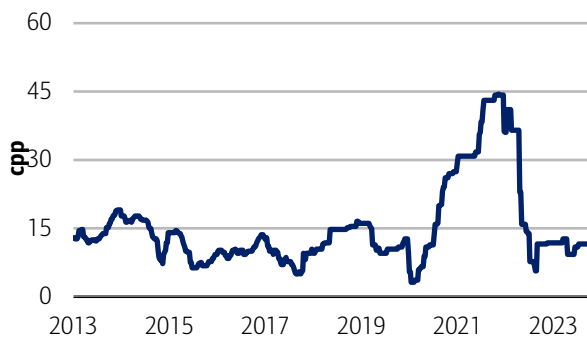


Source: OPIS, Bloomberg, BofA Global Research Estimates

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Exhibit 19: US ethylene dichloride price

Prices have collapse with international PVC price

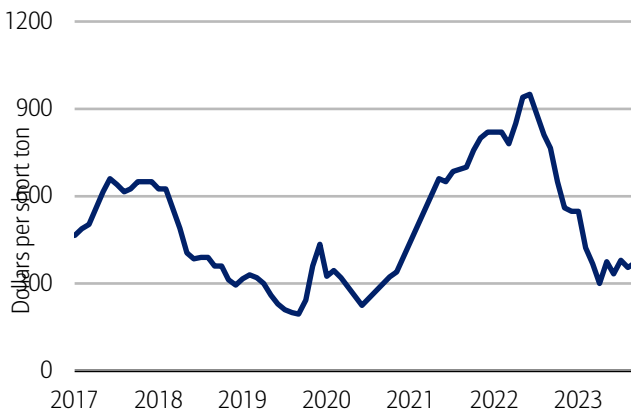


Source: Bloomberg, BofA Global Research

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Exhibit 20: Caustic export price (\$/ short ton)

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

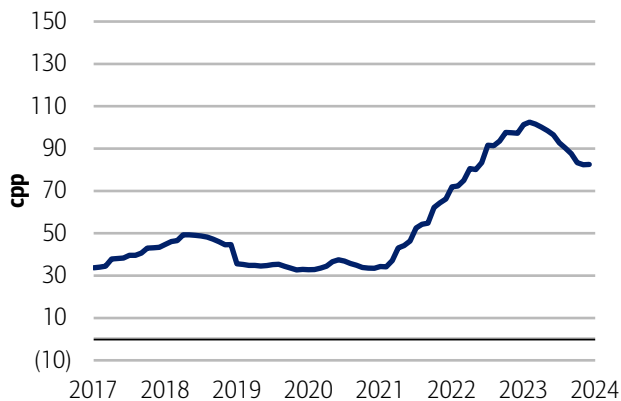


Source: Bloomberg

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Exhibit 21: US ECU Cash Margins

Cash margins remain high as cost deflation offset softer contract caustic

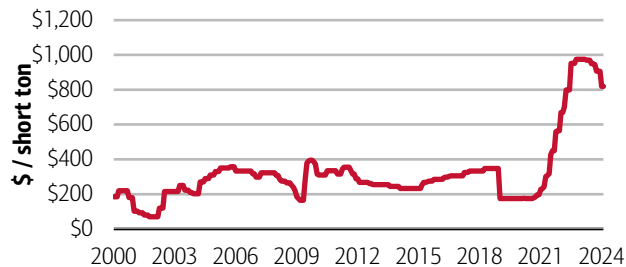


Source: Bloomberg, OPIS

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Exhibit 22: US chlorine price

Chlorine prices have moved higher on initiatives by Olin

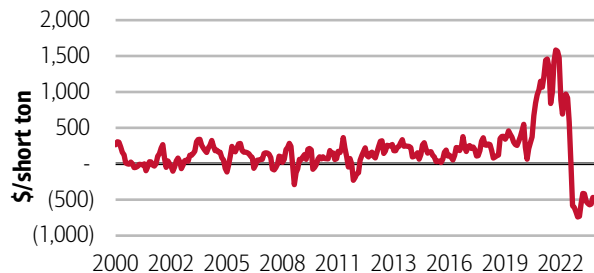


Source: OPIS

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Exhibit 23: Implied chlorine premium in spot PVC vs. merchant price

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

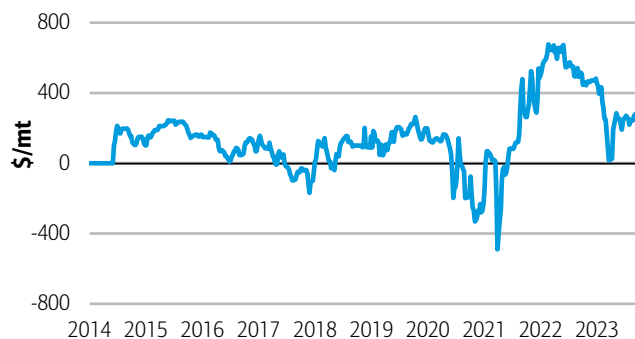


Source: OPIS, BofA Global Research

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Exhibit 24: US acetic acid spread to China

US acetic acid spread to china is near to zero

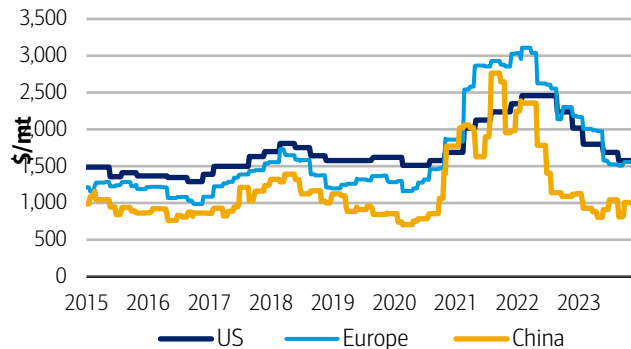


Source: Bloomberg, BofA Global Research

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Exhibit 25: Global VAM contract prices

US & European VAM prices remain bid

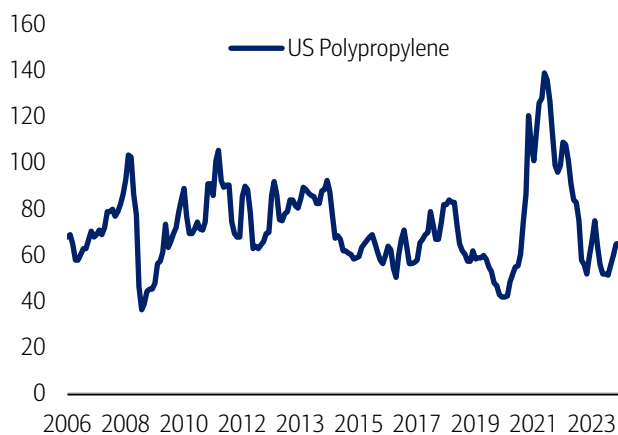


Source: Bloomberg

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Exhibit 26: US Polypropylene price

Polypropylene prices have retraced sharply

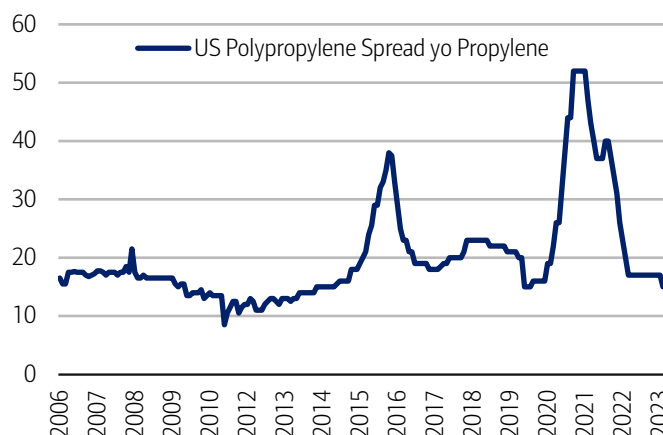


Source: OPIS

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Exhibit 27: Polypropylene spread to propylene

PP spread to monomer would seem to have more downside

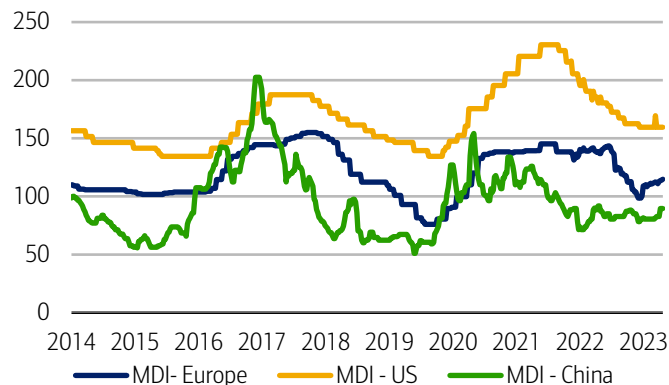


Source: OPIS and BofA Global Research

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Exhibit 28: Global polymeric MDI price deck

US remains at a healthy premium to global markets

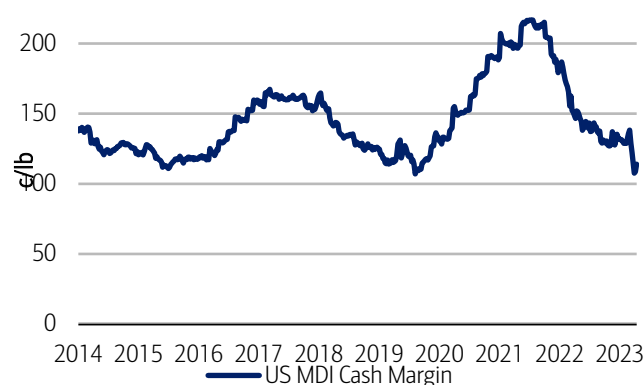


Source: ICIS

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Exhibit 29: US Polymeric MDI spread over raw material costs

US margins are off peak, but still at healthy levels

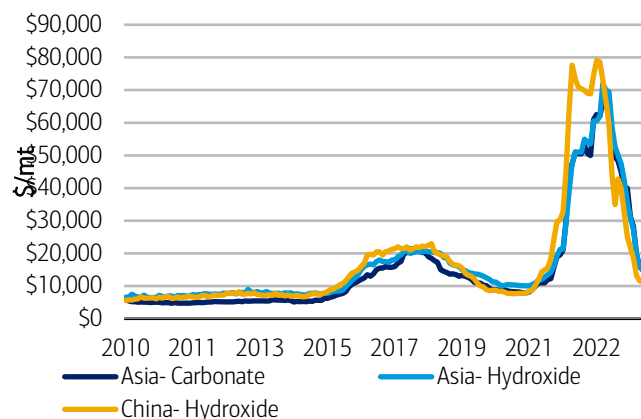


Source: ICIS, OPIS, BofA Global Research Estimates

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Exhibit 30: 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 31: 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 32: 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	228	492	601	354	678	613	591	522	342	368	374	334
Urea granular (US Midwest \$/st)	297	302	272	535	667	434	752	679	633	605	421	466	428	422
Urea granular (Mediterranean \$/st)	265	252	238	510	687	364	800	703	682	562	386	317	393	359
Urea granular (SE Asia \$/st)	267	255	240	503	629	352	728	687	570	533	366	325	369	350
Ammonia (US Midwest \$/st)	416	403	328	759	1276	630	1383	1394	1086	1241	834	466	517	703
UAN (US Midwest \$/st)	212	202	160	372	561	300	602	614	482	547	351	285	268	294
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
	11/30	12/7	12/14	12/21	12/28	1/4	1/11	1/18	1/25	2/1	2/8	2/15	2/22	2/29
Nitrogen Prices														
Urea granular (US NOLA \$/st)	304	319	302	300	300	304	302	318	345	351	348	358	353	375
Urea granular (US Midwest \$/st)	425	398	385	398	398	380	380	385	395	400	393	400	410	450
Urea granular (Mediterranean \$/st)	332	321	329	312	312	322	327	347	364	384	388	381	367	357

Exhibit 32: Nitrogen pricing overview

Nitrogen prices have started to decrease materially

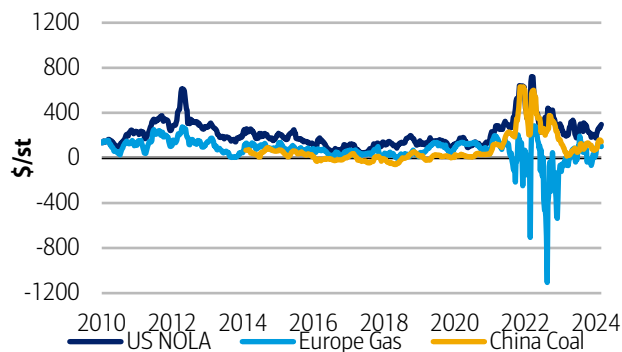
	2018	2019	2020	2021	2022	2023		1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Urea granular (SE Asia \$/st)	322	329	311	316	316	316	316	325	363	375	384	384	384	370	370
Ammonia (US Midwest \$/st)	738	738	610	610	610	610	600	600	600	600	600	625	625	625	625
UAN (US Midwest \$/st)	297	287	287	287	287	275	275	268	268	268	268	268	268	297	312
Feedstock Costs															
Natural Gas (US HH \$/mmbtu)	2.81	2.58	2.49	2.61	2.51	2.89	3.31	2.52	2.71	2.08	1.85	1.61	1.60	1.84	1.81
Natural Gas (UK ICE \$/mmbtu)	15.10	13.94	12.18	10.47	10.84	10.27	11.07	10.19	8.87	8.81	9.03	8.39	7.63	7.15	8.13
Anthracite coal (China \$/mt)	161	159	157	157	156	155	154	151	146	143	140	139	139	142	142

Source: CRU, Bloomberg, BofA Global Research

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Exhibit 33: Global Granular Urea Cash Margins (\$/st)

European urea margins remain challenged

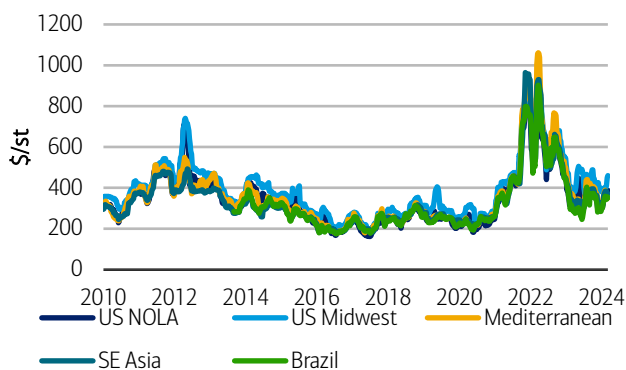


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 35: Global Granular Urea Prices (\$/st)

Prices have come off their recent highs

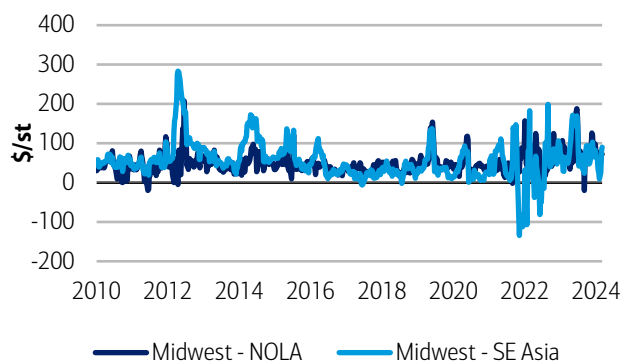


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 37: US Urea Price Differentials (\$/st)

US Midwest urea prices are above NOLA import price

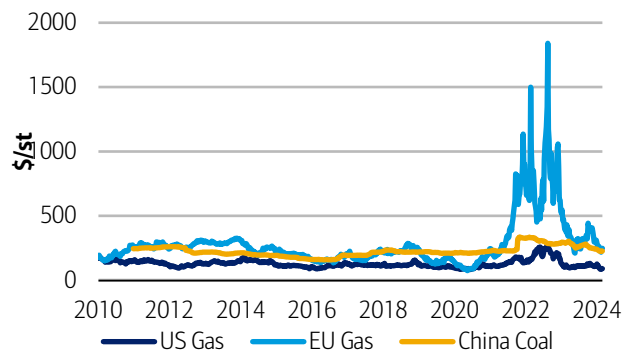


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 34: Global Granular Urea Cash Cost (\$/st)

US gas costs at bottom of cost curve

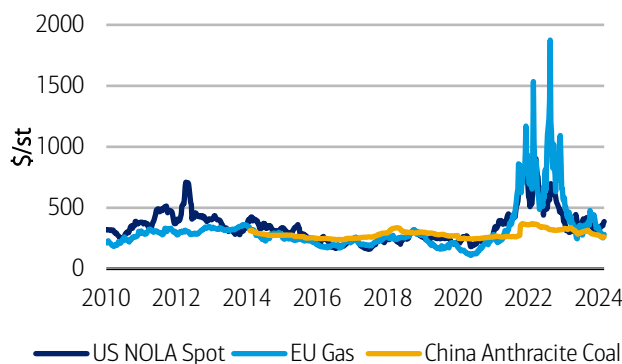


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 36: US NOLA Urea vs Delivered Costs (\$/st)

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

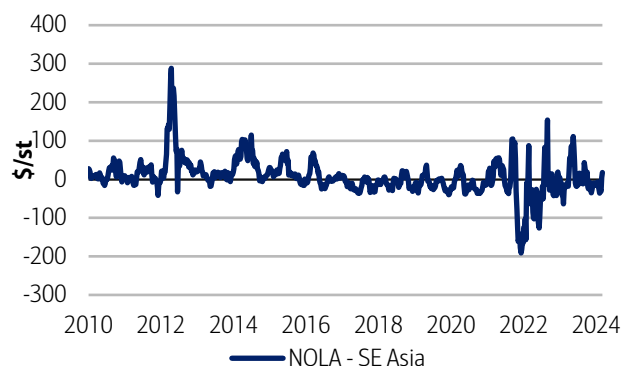


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 38: US NOLA - SE Asia Urea Price (\$/st)

US NOLA urea price is below Asia prices

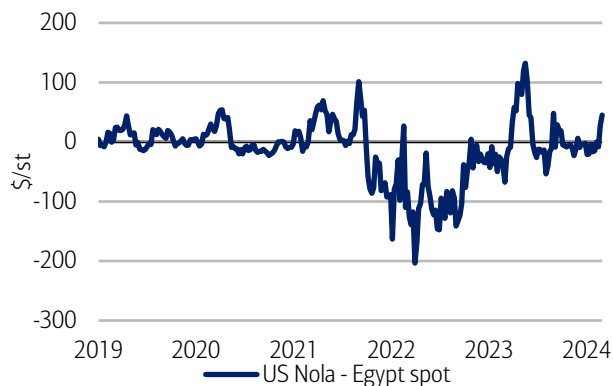


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 39: US NOLA – Egypt Urea Price (\$/st)

US NOLA price is now above Egypt prices

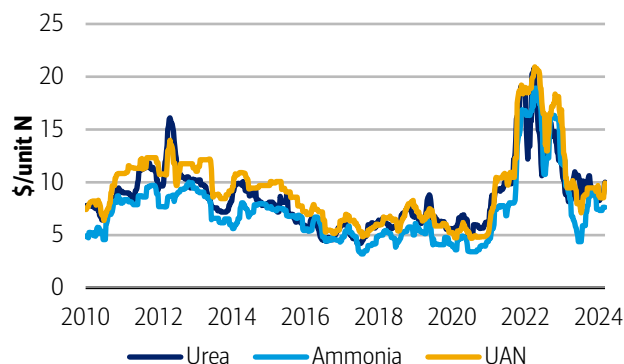


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 41: US Midwest Prices (\$/unit N)

Midwest UAN prices have surpassed urea on a unit N basis

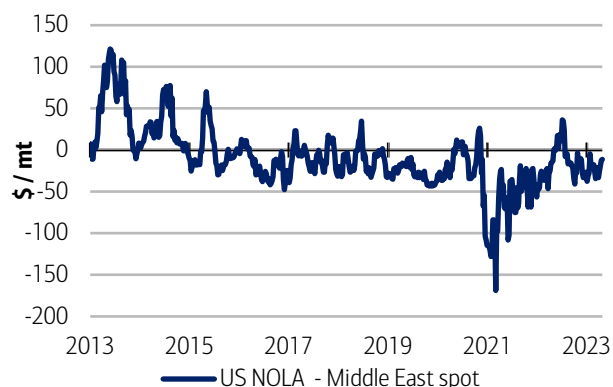


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 43: US NOLA implied vs. Middle East urea price spread

US NOLA urea price is now comparable to Middle East levels

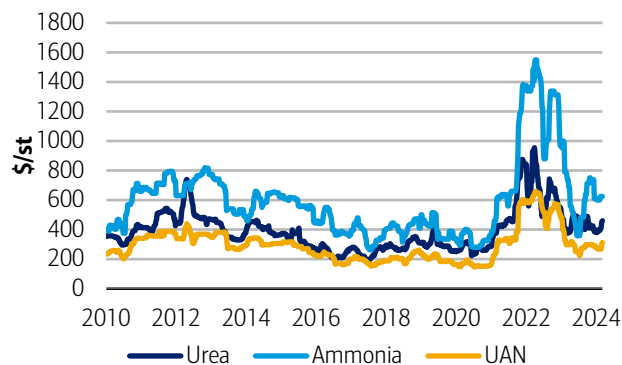


Source: CRU, BofA Global Research

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Exhibit 40: US Midwest Prices (\$/st)

All nitrogen fertilizer products have increased sharply



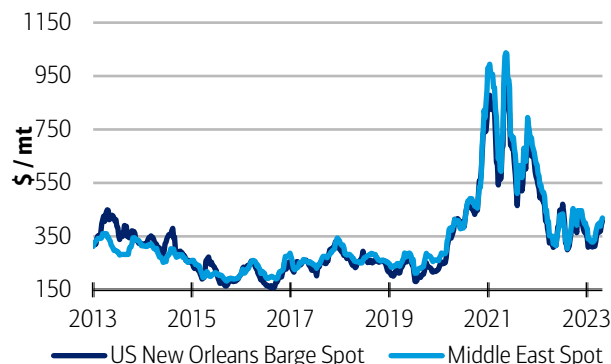
Source: CRU, Bloomberg, BofA Global Research

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Exhibit 42: US NOLA implied vs. Middle East urea prices (\$/mt)

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

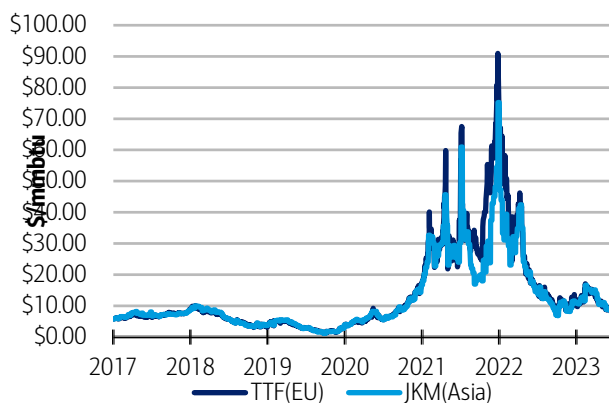


Source: CRU, BofA Global Research

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Exhibit 44: EU vs. Asia NatGas Prices (\$/mmBTU)

Asian nat gas prices are well below EU prices

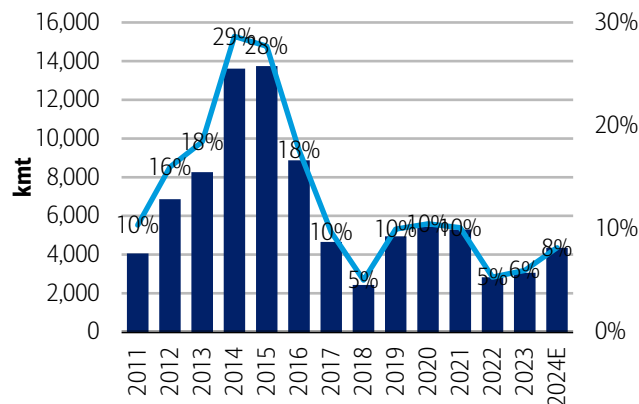


Source: Bloomberg, BofA Global Research

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Exhibit 45: Chinese Urea Exports & % of World Total

Chinese urea exports are well below prior peak levels

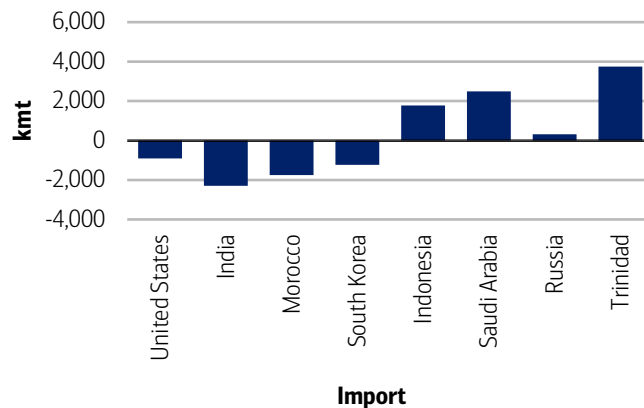


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 46: Global NH3 Trade Balance 2023

Trinidad is the largest ammonia exporter

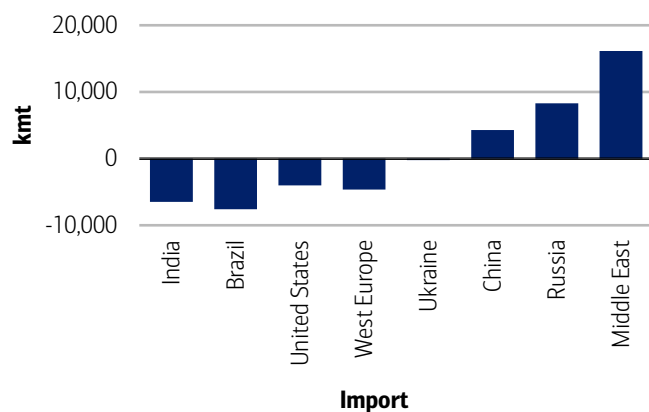


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 47: Global Urea Trade Balance 2023

Middle East is the largest urea exporter

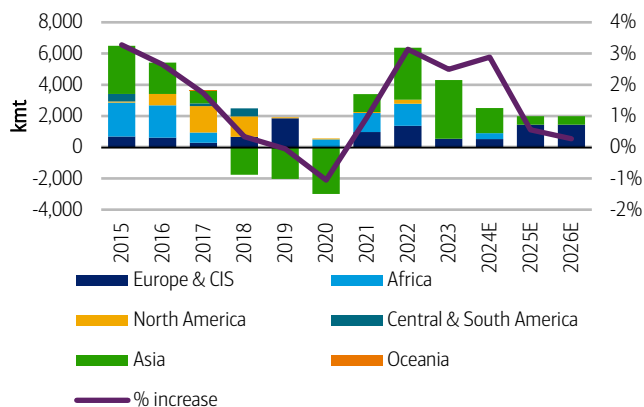


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 48: Global Urea Capacity additions by region

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

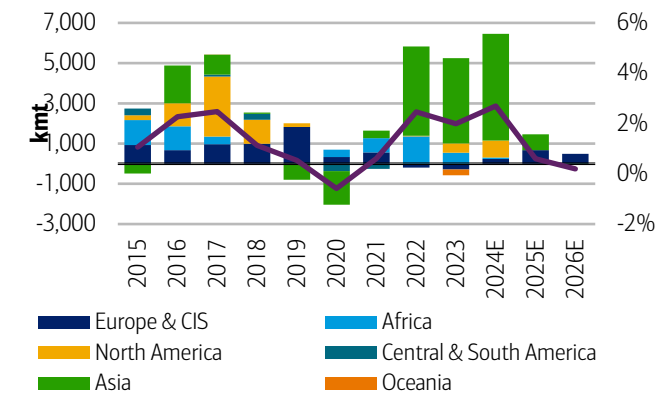


Source: BofA Global Research

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Exhibit 49: Global NH3 Capacity additions by region

New global ammonia coming in 2022

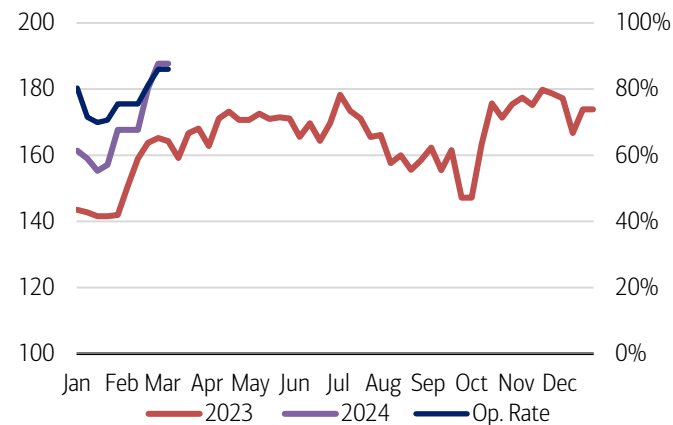


Source: CRU, BofA Global Research

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Exhibit 50: 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 51: Chinese Urea Daily Production as a % of 5-yr max Daily production (weekly kmt)

China's urea production is seasonally strong

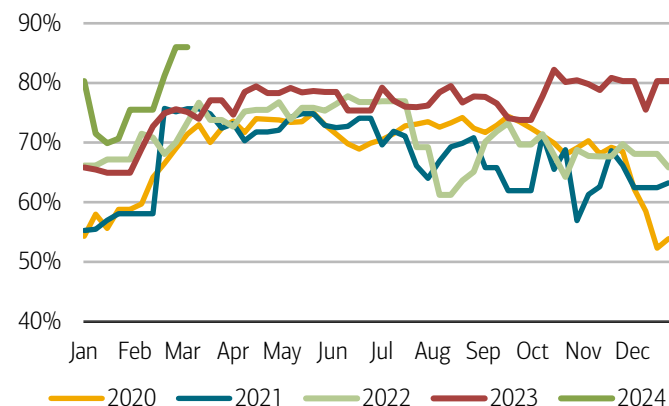


Source: CFMW, Bloomberg, BofA Global Research

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Exhibit 52: Chinese Urea Operating Rates

Operating rates have collapsed recently

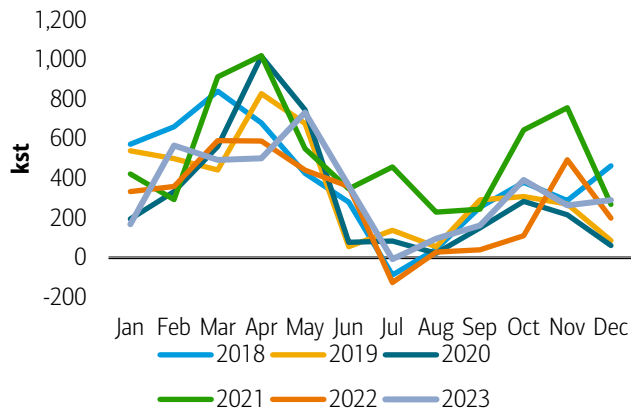


Source: CFMW, Bloomberg, BofA Global Research

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Exhibit 53: US Urea Net Imports (kst)

Net imports running at low levels year-to-date

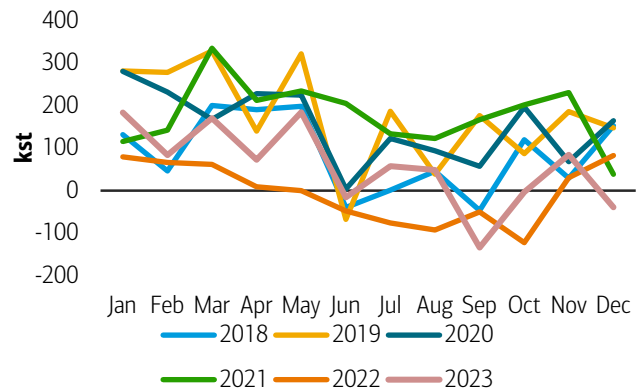


Source: TFI, Bloomberg, BofA Global Research

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Exhibit 54: US UAN net imports

UAN net imports are down sharply

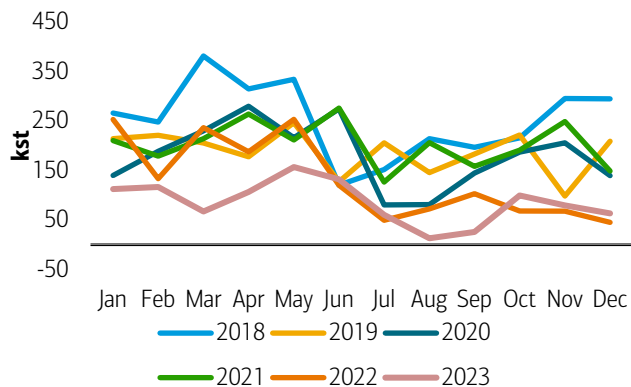


Source: TFI, Bloomberg, BofA Global Research

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Exhibit 55: 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 56: 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)	312	333	282	569	799	466		830	876	808	684	503	496	427	440
Brazil Spot (\$/mt)	321	329	239	539	850	391		877	1115	844	565	495	383	351	335
Southeast Asia Spot (\$/mt)	279	294	245	393	781	380		656	929	873	664	494	397	309	318
Vancouver Spot (\$/mt)	281	295	230	432	795	381		755	986	828	612	497	380	326	321
China Contract (\$/mt)	247	290	242	244	550	427		432	590	590	590	590	503	307	307
India Contract (\$/mt)	257	288	248	293	573	428		523	590	590	590	590	422	382	319
	11/30	12/7	12/14	12/21	12/28	1/4	1/11	1/18	1/25	2/1	2/8	2/15	2/22	2/29	3/7
Potash Prices															
Midwest Spot (\$/mt)	446	446	446	446	446	439	422	408	406	408	417	417	424	422	422
Brazil Spot (\$/mt)	333	325	315	315	315	315	308	295	295	295	283	283	285	290	300
Southeast Asia Spot (\$/mt)	320	320	320	320	320	320	320	315	315	310	308	308	308	303	303
Vancouver Spot (\$/mt)	286	286	284	287	287	287	288	283	283	278	277	277	276	268	265
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

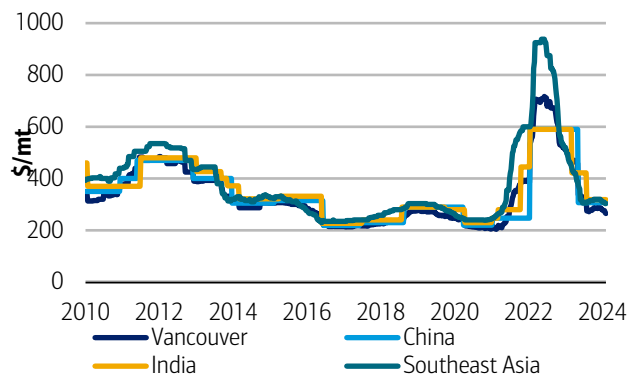
Source: CRU, Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH



Exhibit 57: Global Standard Potash Prices (\$/mt)

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

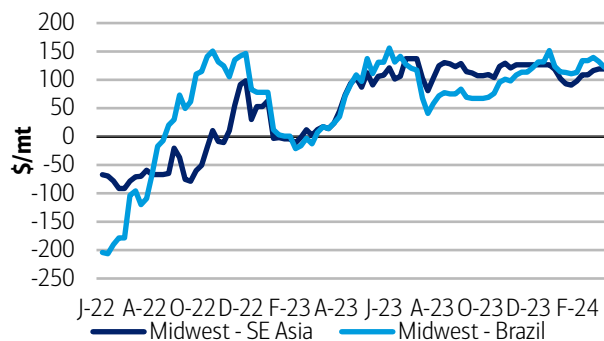


Source: CRU, Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 59: Potash Price Differentials (\$/mt)

US Midwest potash prices trade at a discount to global ones

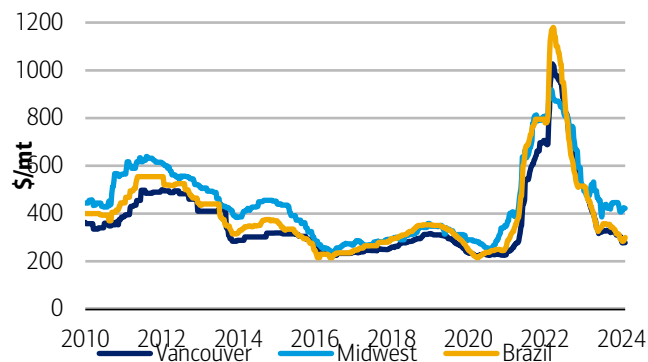


Source: CRU, Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 58: Global Granular Potash Prices (\$/mt)

Granular potash prices are off their highs

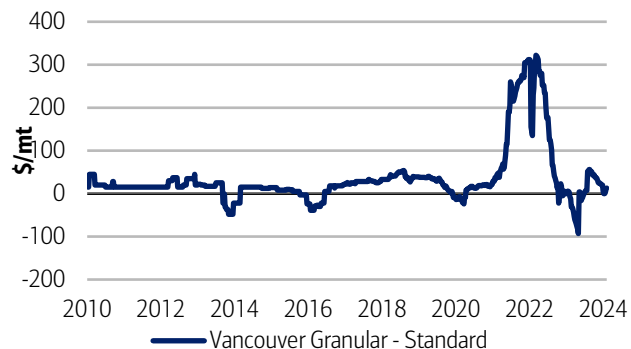


Source: CRU, Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 60: Granular Premium over Standard (\$/mt)

The granular premium over standard has recently reversed

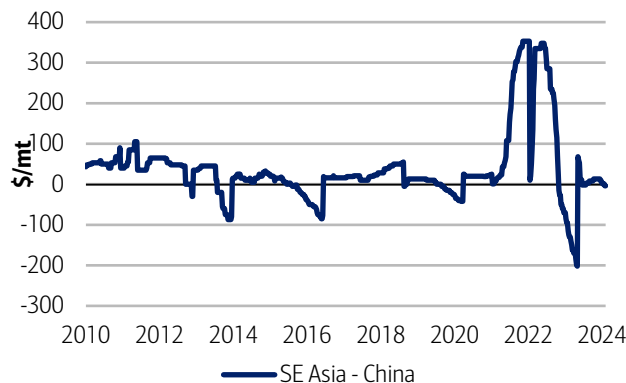


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 61: SE Asia Spot vs. China Contract (\$/mt)

SE Asia spot potash market is well above the contract price

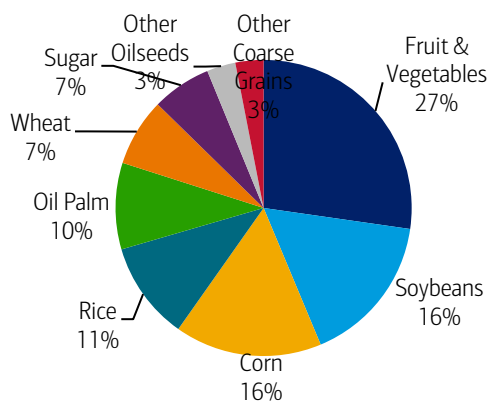


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 63: Global Potash Demand By Crop(2018)

Potash is used on all crops

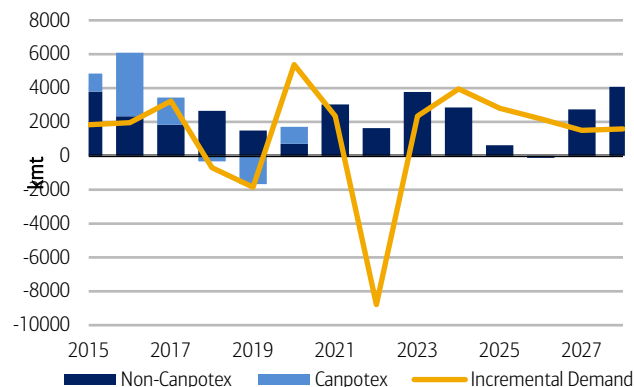


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 65: 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 62: US NOLA vs. Brazil potash price spread

US NOLA urea price is now far below Brazil levels

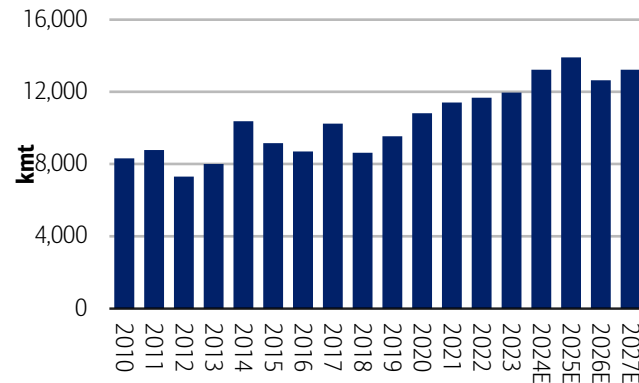


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 64: Russian Potash Exports (kmt)

Russia remains a large potash exporter

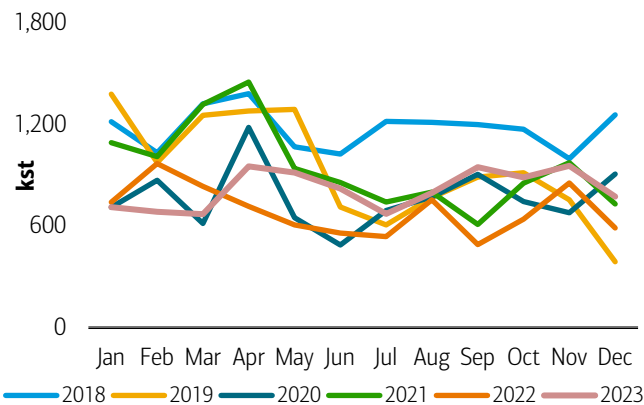


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 66: US MOP Net Imports

The US normally imports roughly 1mnt of potash per month

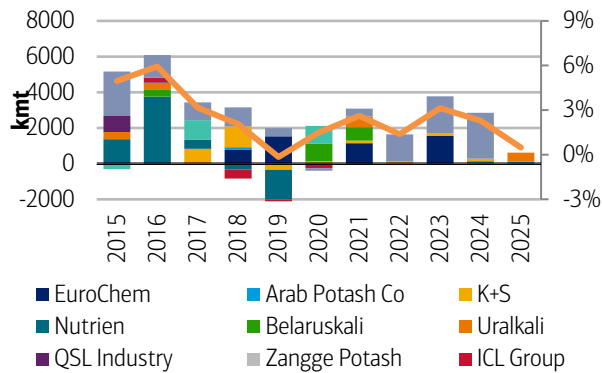


Source: TFI, Bloomberg, BofA Global Research

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Exhibit 67: Net Potash Capacity Addition by Company

Eurochem has significant Potash capacity to provide to the market

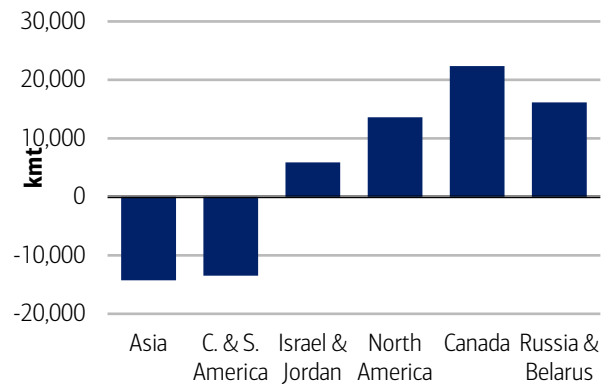


Source: CRU, BofA Global Research

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Exhibit 68: Global Potash Trade Flows

Canada & FSU are key potash supply regions



Source: CRU, BofA Global Research

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Phosphate**Exhibit 69: Historical pricing data for phosphate fertilizer**

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

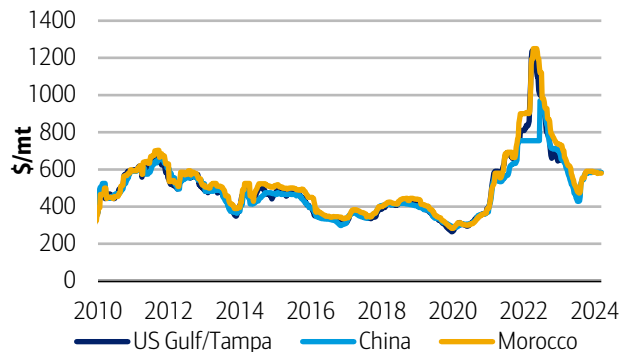
	2018	2019	2020	2021	2022	2023		1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Phosphate Prices															
DAP (US Midwest , \$/mt)	471	402	385	706	912	692		929	1000	889	830	740	743	622	664
DAP (US Gulf/Tampa, \$/mt)	419	344	324	644	894	560		950	1115	838	674	644	546	501	550
DAP - barge (New Orleans, \$/mt)	435	338	345	667	845	605		880	932	833	733	676	584	559	599
DAP (China, \$/mt)	435	338	345	667	845	605		880	932	833	733	676	584	559	599
DAP (Morocco, \$/mt)	412	348	323	595	779	557		755	805	846	709	636	503	507	583
MAP (US Gulf/Tampa, \$/mt)	429	361	324	656	964	589		979	1203	918	759	685	557	524	589
MAP - barge (New Orleans, \$/mt)	418	344	323	659	898	552		959	1114	845	674	641	525	497	546
MAP (Morocco, \$/mt)	444	340	356	706	869	633		907	967	869	731	638	568	643	682
MAP (Brazil, \$/mt)	427	361	327	679	964	574		1008	1195	935	720	668	553	514	562
Feedstock Costs															
Phosphate Rock (N. Africa, FOB, \$/mt)	94	95	90	137	277	255		213	286	320	290	300	285	215	220
Ammonia, (Tampa, CFR, \$/mt)	312	247	233	604	1160	514		1168	1272	1089	1110	744	369	343	598
Sulphur, (Tampa, FOB, \$/mt)	122	83	54	166	313	97		297	481	362	110	124	107	59	98
	11/30	12/7	12/14	12/21	12/28	1/4	1/11	1/18	1/25	2/1	2/8	2/15	2/22	2/29	3/7
Phosphate Prices															
DAP (US Midwest , \$/mt)	650	694	694	678	678	714	758	742	742	742	742	717	739	739	794
DAP (US Gulf/Tampa, \$/mt)	550	550	560	560	560	560	560	560	560	560	560	560	560	560	560
DAP - barge (New Orleans, \$/mt)	599	615	623	623	623	643	665	659	657	648	648	637	654	667	717
DAP (Morocco, \$/mt)	590	590	585	585	585	585	585	585	578	580	580	580	580	580	580
MAP (US Gulf/Tampa, \$/mt)	545	545	560	560	560	560	560	560	560	560	560	560	560	560	560
MAP - barge (New Orleans, \$/mt)	661	665	672	678	678	689	694	694	689	694	683	667	681	681	694
MAP (Morocco, \$/mt)	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578
MAP (Brazil, \$/mt)	563	563	563	563	563	563	563	563	563	560	560	560	560	560	565
Feedstock Costs															
Phosphate Rock (N. Africa, FOB, \$/mt)	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Ammonia, (Tampa, CFR, \$/mt)	625	625	625	525	525	525	525	525	445	445	445	445	445	445	445
Sulphur, (Tampa, FOB, \$/mt)	102	102	102	102	102	102	69	69	69	69	69	69	69	69	69

Source: CRU, Bloomberg, BofA Global Research

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Exhibit 70: Global DAP Prices

DAP prices globally are up sharply

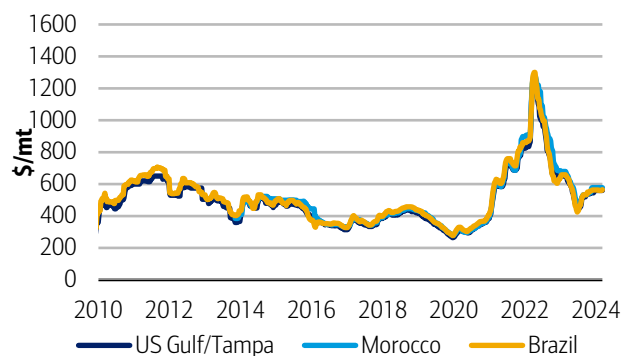


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 71: US MAP Prices (\$/mt)

Morocco currently has the highest MAP prices

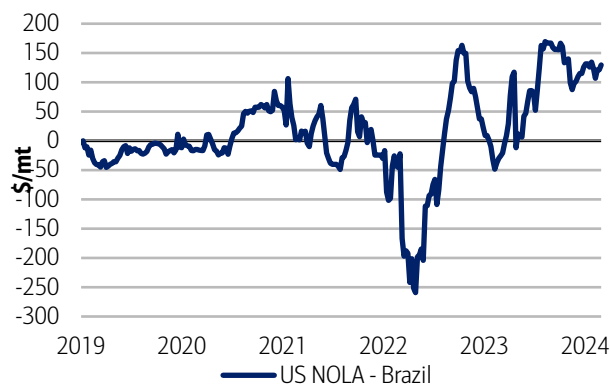


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 72: US NOLA vs Brazil phosphate price spread

US NOLA phosphate prices is above Brazil levels

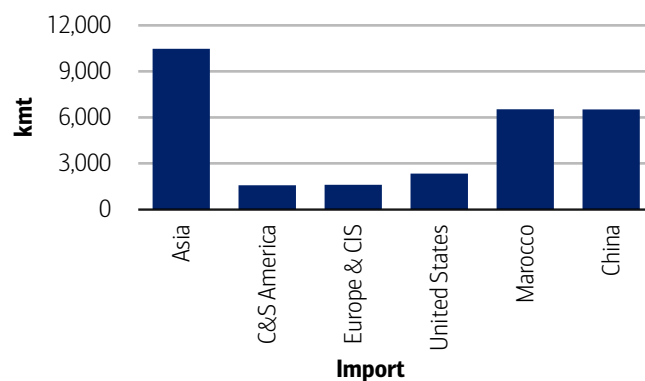


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 73: Global Phosphate Trade Flows 2023

China is the largest phosphate importer

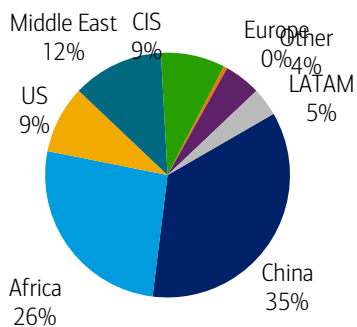


Source: CRU, Bloomberg, BofA Global Research

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Exhibit 74: Phosphate Rock Production by Region

China is the largest phosphate rock supplier



Source: CRU, Bloomberg, BofA Global Research

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Price objective basis & risk

Corteva (CTVA, B-2-7, \$54.68)

Our PO of \$57 is based on 11x our 2024 EBITDA estimate and includes a roughly \$2bn adjustment for legal liabilities (\$1.5bn for a potential chlorpyrifos liability and roughly \$500mn for a potential PFAS liability). We view 11x, around the 5-year average of specialty chemical companies, as appropriate given continued strength of Ag fundamentals balanced by rising risks.

Downside risks are aggressive soybean seed pricing, higher raw material costs, weather disruption, and litigation risks.

Upside risks are price/mix gains in seeds, lower raw material costs, improving LatAm FX rates, and better than expected new product growth

Analyst Certification

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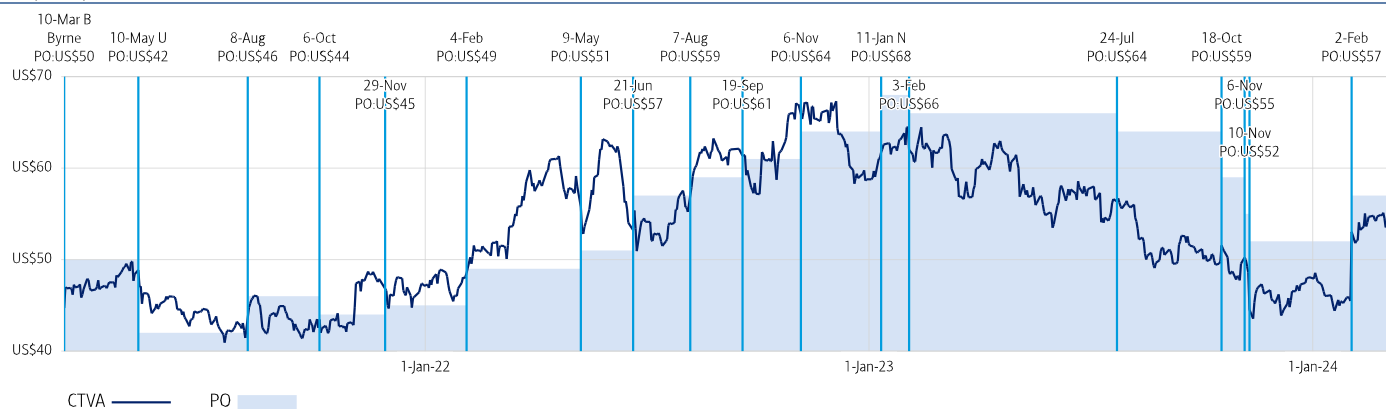
US - Chemicals Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Air Products	APD	APD US	Steve Byrne, CFA
	Axalta Coating Systems	AXTA	AXTA US	Steve Byrne, CFA
	Bunge Limited	BG	BG US	Salvator Tiano, CFA
	CF Industries	CF	CF US	Steve Byrne, CFA
	Dow Inc	DOW	DOW US	Steve Byrne, CFA
	Eastman Chemical Co	EMN	EMN US	Salvator Tiano, CFA
	Element Solutions Inc.	ESI	ESI US	Steve Byrne, CFA
	Green Plains	GPPE	GPPE US	Salvator Tiano, CFA
	Huntsman Corp	HUN	HUN US	Salvator Tiano, CFA
	Linde	LIN	LIN US	Steve Byrne, CFA
	Linde	LINGY	LIN GY	Steve Byrne, CFA
	Nutrien	NTR	NTR US	Steve Byrne, CFA
	Olin Corp	OLN	OLN US	Steve Byrne, CFA
	PPG Industries Inc.	PPG	PPG US	Steve Byrne, CFA
	Sigma Lithium	SGML	SGML US	Steve Byrne, CFA
	The Mosaic Company	MOS	MOS US	Steve Byrne, CFA
NEUTRAL				
	Archer-Daniels-Midland Company	ADM	ADM US	Salvator Tiano, CFA
	Corteva	CTVA	CTVA US	Steve Byrne, CFA
	Ecolab Inc	ECL	ECL US	Steve Byrne, CFA
	International Flavors & Fragrances	IFF	IFF US	Salvator Tiano, CFA
	LyondellBasell Industries	LYB	LYB US	Steve Byrne, CFA
	Origin Materials	ORGN	ORGN US	Steve Byrne, CFA
UNDERPERFORM				
	Celanese Corporation	CE	CE US	Salvator Tiano, CFA
	DuPont	DD	DD US	Steve Byrne, CFA
	FMC Corporation	FMC	FMC US	Steve Byrne, CFA
	RPM International Inc	RPM	RPM US	Steve Byrne, CFA
	Sherwin-Williams Company	SHW	SHW US	Steve Byrne, CFA
	Westlake Chemical Partners, LP	WLKP	WLKP US	Steve Byrne, CFA
	Westlake Corp	WLK	WLK US	Steve Byrne, CFA
RVW				
	Albemarle	ALB	ALB US	Steve Byrne, CFA

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Corteva (CTVA) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

Equity Investment Rating Distribution: Chemicals Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	66	47.83%	Buy	33	50.00%
Hold	33	23.91%	Hold	16	48.48%
Sell	39	28.26%	Sell	20	51.28%

Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

^{R1} Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R2}
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

^{R2} Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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