

# CF Industries

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# Introduction



# Thesis

- Buy CF shares
- Target Price: \$129.38
- Upside: 31.3%
- Key Drivers:
  - Elevated fertilizer prices amid global uncertainty and supply constraints
  - Key positioning in the United States to export to foreign markets, esp. Europe
  - Ongoing energy crisis removing future production of fertilizers from market

# Business Description

CF Industries is a chemical company which produces agricultural fertilizers

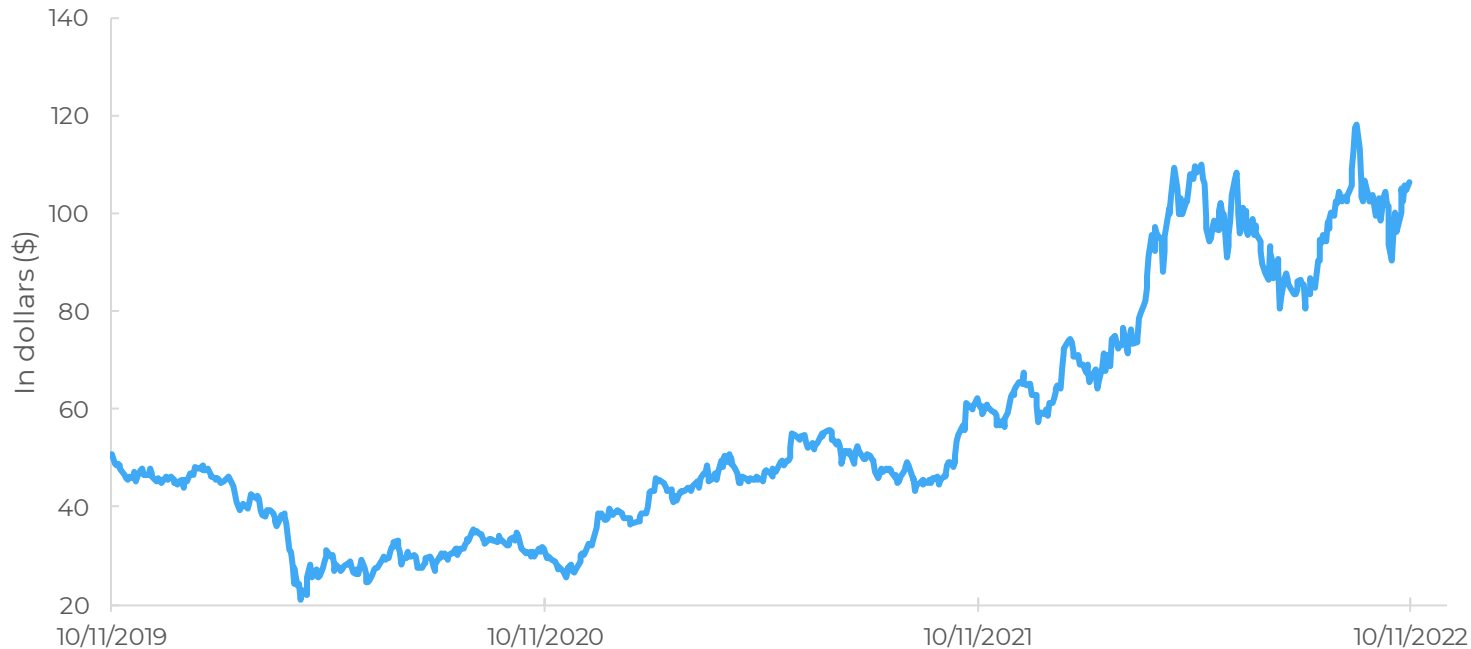
Products include Ammonia, Urea Ammonium Nitrate (UAN), Granular Urea, Ammonium Nitrate (AN), and other nitrogen products

Fertilizers improve the yield of crops by supplementing the nutrients of soil, increasing the amount consumed and its absorption rate

Facilities are located throughout the United States, Canada, United Kingdom, and one joint venture in Trinidad and Tobago

# Price Chart and Key Statistics

CF Price Chart 2019-2022



Ticker (NYSE)	CF
Share Price (\$)	102.83
Market Cap (in billions)	20.67
P/E (TTM)	8.43
P/FCF	5.57
Beta	1
Debt/Equity	.65
Dividend Yield %	1.56
Return on Equity (%)	69.7
Institutional Ownership (%)	98
1 month return	-0.82%
3-month return	+19.10%
52-week return	+65.48%

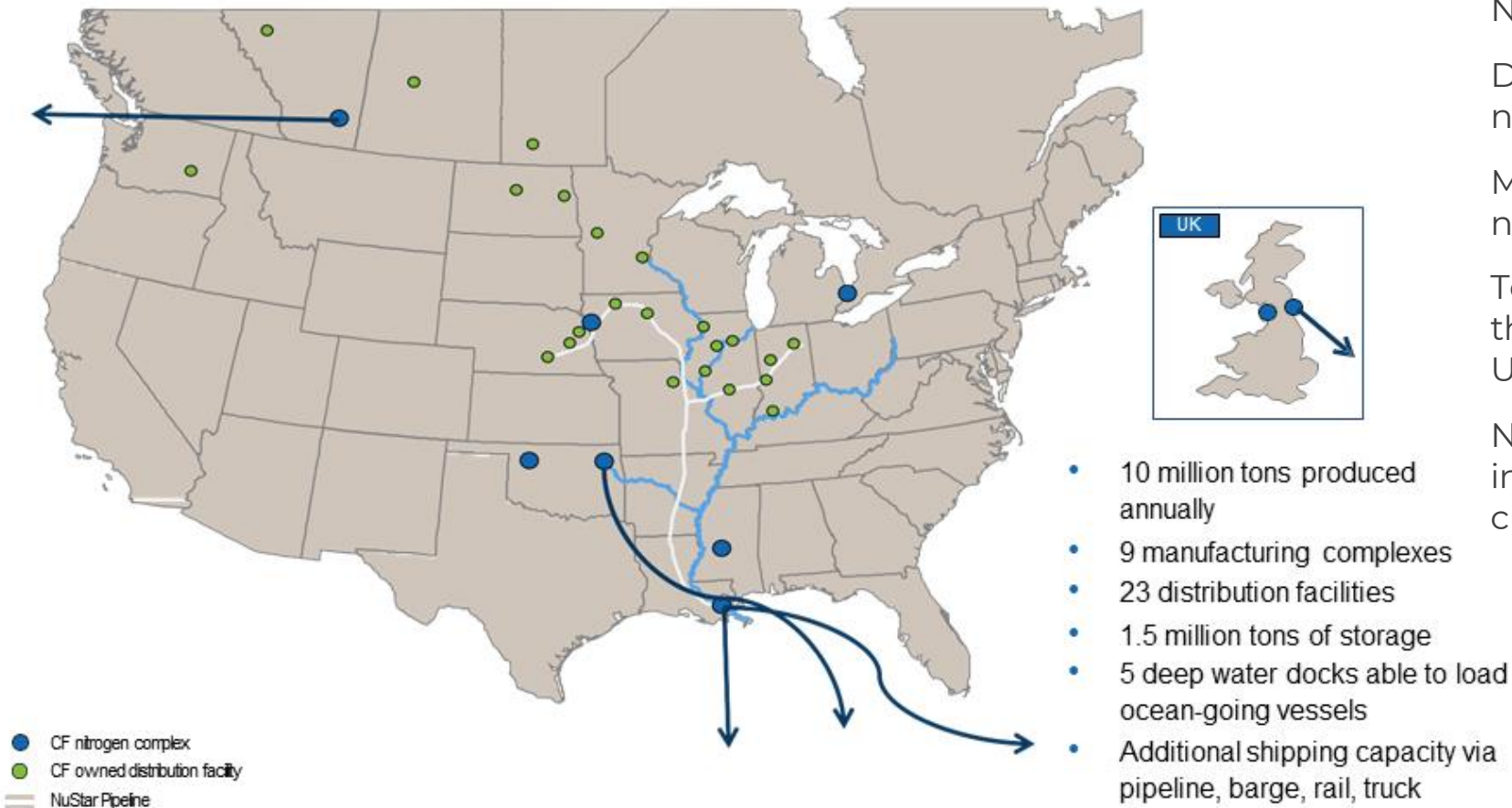
# Products

	Ammonia	Granular Urea	Urea Ammonium Nitrate	Ammonium Nitrate
Nitrogen content	82% (18% hydrogen)	46%	28-32% (CF produced @ 32%)	34%
Average annual capacity	10.5 million tons	4.8 million tons	7.3 million tons	2.2 million tons
Properties	Pressurized or cold-stored	Solid, dry product Easy to store	Liquid product can be combined with other inputs	Dry, absorbs moisture Short storage life
Other uses	Used to upgrade to other products	Highly soluble in water	Fast and slow release, and is non-reactive	
Notes	Applied in spring and fall	Most widely traded form of nitrogen fertilizer in world	Two forms of nitrogen input for plants	Consists of two forms of nitrogen

## CF has the leading asset base

Ideally positioned to lead hydrogen economy by leveraging existing network

CF has the world's largest and most integrated ammonia production and distribution network



Notable assets:

Donaldsonville, Louisiana (largest nitrogen complex in the world)

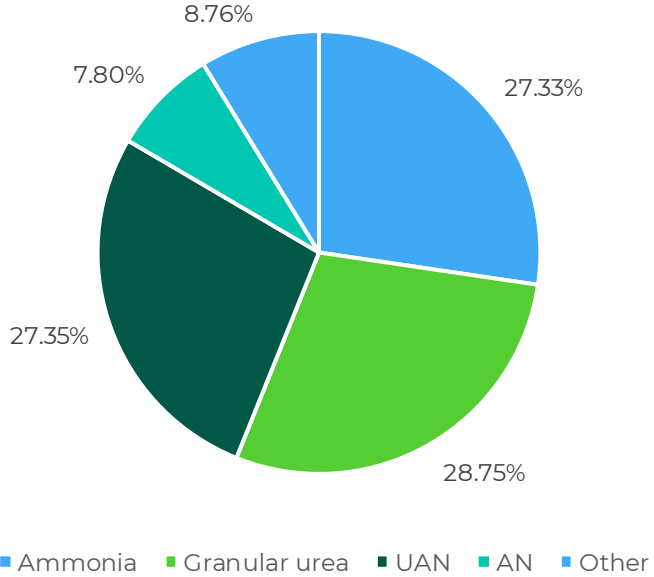
Medicine Hat, Canada (largest nitrogen complex in Canada)

Terminals and distribution throughout the Midwestern United States

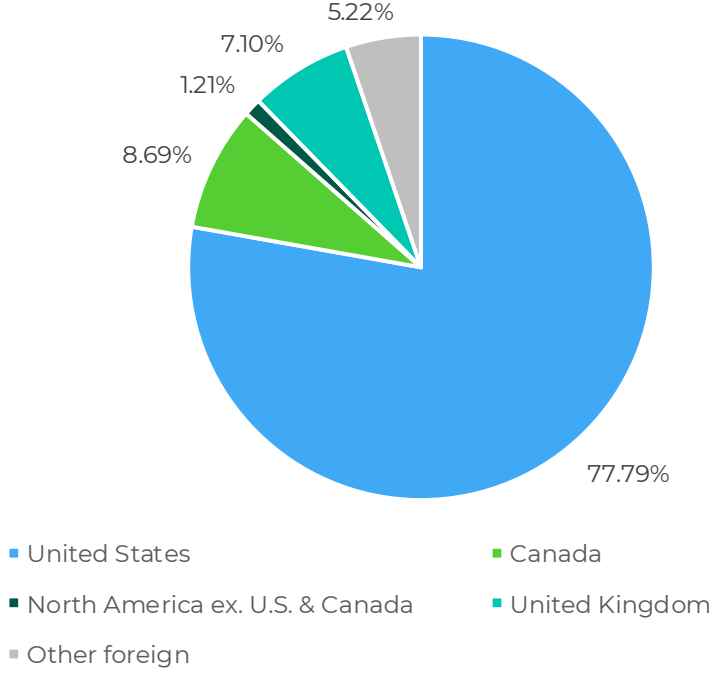
Nitrogen manufacturing facilities in the United Kingdom but are currently shut down

# Revenues by segment and geography

Net Sales by Product 2021



Sales by Geographic Region 2021





# Key Drivers

## Core business

Key positioning in the United States to export to foreign markets, esp. Europe

Cheaper natural gas relative to global prices improving margins

CF Industries is expanding into “green” and “blue” (low-carbon) ammonia, adding to their business towards clean energy

## Global markets

Elevated fertilizer prices amid global uncertainty and supply constraints

Ongoing energy crisis removing future production of fertilizers from market

Inelastic supply as new supply could take years

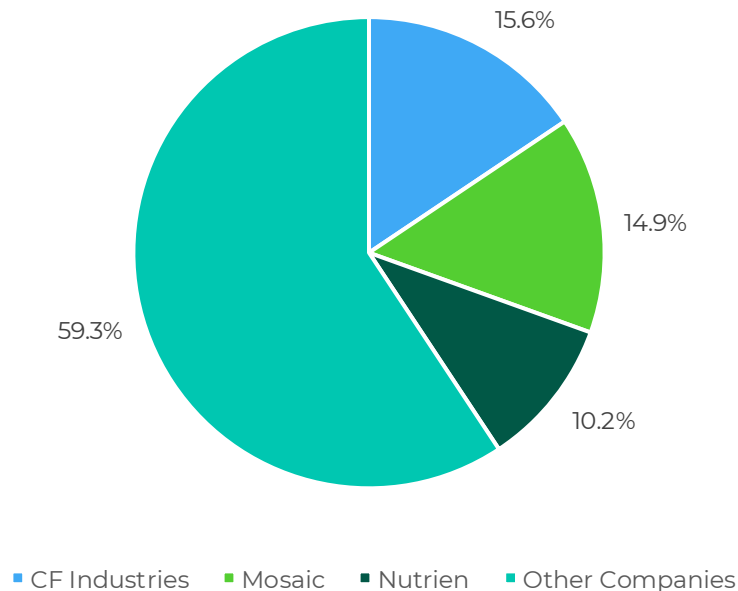


# Industry Analysis

# Industry Analysis – U.S. Markets

- CF Industries main competitors are Nutrien and Mosaic
- The fertilizer industry is cyclical and global, making for dynamic markets
- The United States is a net importer of fertilizer
  - 3<sup>rd</sup> largest globally with main origins from Trinidad and Tobago, Canada

US Fertilizer Industry Market Share (2021)



U.S. Imports and Exports of Goods by End-Use Category and Commodity (in millions of dollars)						
	Aug-22	July 2022 R*	Monthly change	YTD 2022	YTD 2021	YTD Change
<b>Imports</b>						
Fertilizers, pesticides, and insecticides	1,971	2,044	-73	14,762	9,722	5,040
<b>Exports</b>				51.84% YoY		
Fertilizers, pesticides, and insecticides	1,451	1,277	174	9,720	5,980	3,740
				62.54% YoY		
<b>Difference</b>	520	767	-247	5,042	3,742	1,300

Source: U.S. International Trade in Goods and Services Report (census.gov)

\* R stands for revised

# Industry Analysis – World Markets

- Largest producer of fertilizer is China, followed by Russia
- A Chinese export ban on fertilizers in 2019 shifted supply throughout the world
- Russian-Ukrainian war exacerbated supply-demand dynamics

Global capacity for select products (% of total) 2022

Region	Urea	UAN	AN	Ammonia
West Europe	3.13%	7.98%	13.60%	5.24%
Central Europe	1.89%	12.11%	10.46%	3.06%
<b>Europe total</b>	<b>5.02%</b>	<b>20.09%</b>	<b>24.07%</b>	<b>8.29%</b>
East Europe & Central Asia	9.47%	18.79%	24.18%	14.03%
North America	7.51%	45.19%	12.06%	9.80%
Latin America	3.41%	4.05%	3.31%	4.93%
Africa	7.29%	3.03%	6.14%	5.85%
West Asia	11.33%	0.59%	2.37%	9.46%
South Asia	18.23%	0.00%	2.82%	11.08%
East Asia	37.48%	7.41%	22.05%	35.58%
Oceania	0.25%	0.86%	3.01%	0.98%

Source: IFASTAT

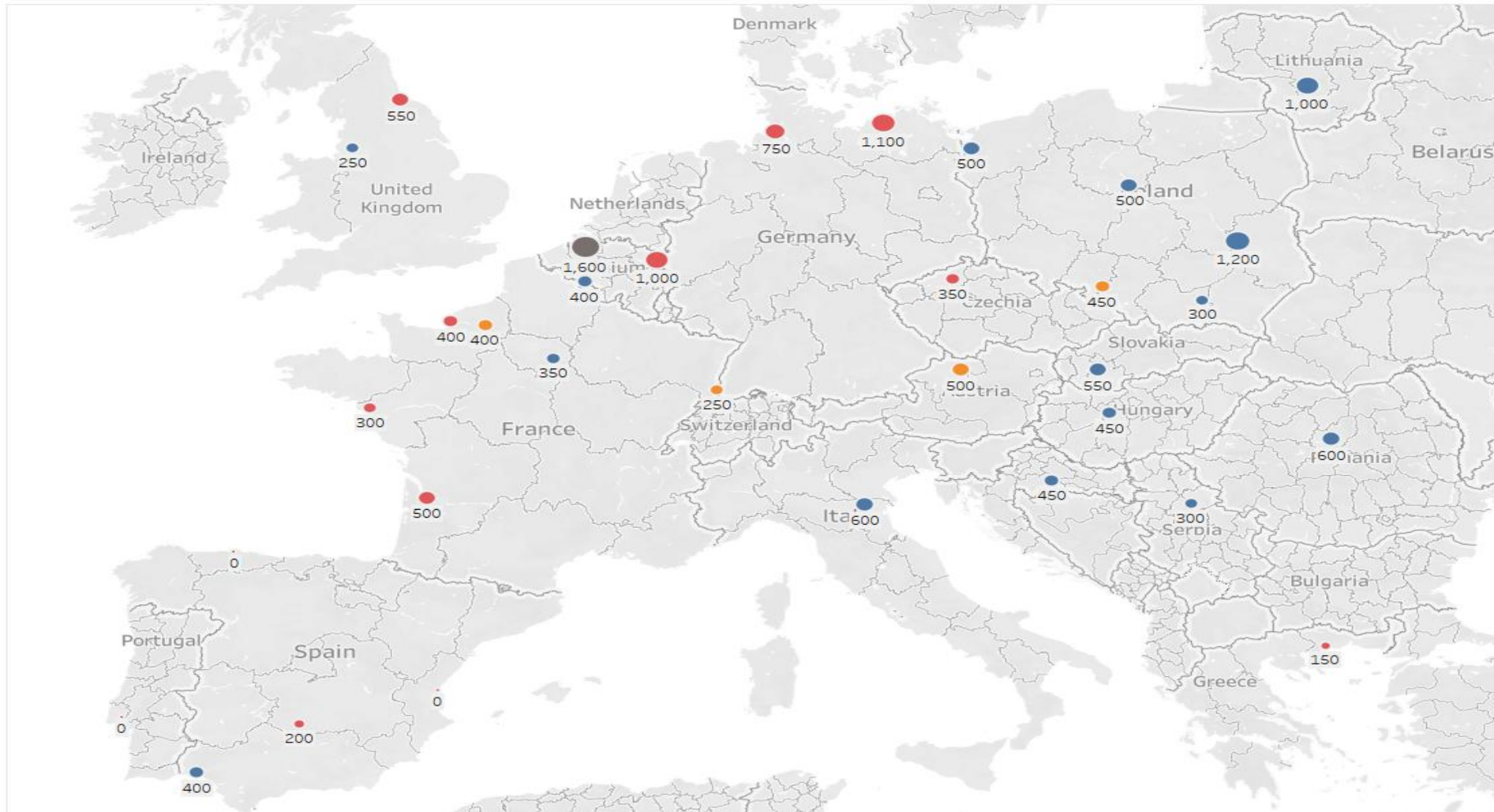
Global production of select products (% of total) 2020

Region	Ammonia	Urea
West Europe	5.80%	3.28%
Central Europe	2.88%	1.77%
<b>Europe total</b>	<b>8.68%</b>	<b>5.06%</b>
E. Europe & C. Asia	14.61%	9.14%
North America	11.84%	8.58%
Latin America	3.48%	1.68%
Africa	5.08%	6.42%
West Asia	9.53%	12.95%
South Asia	10.82%	18.21%
East Asia	34.85%	37.75%
Oceania	1.11%	0.23%

# Industry Analysis – European Question

- Western and Central Europe comprises of:
  - 8.3% of global Ammonia ( $\text{NH}_3$ ) production
  - 24% of global Ammonium Nitrate production (AN)
  - 20% of global Urea Ammonium Nitrate production (UAN)
  - 5% of global Urea production
- Due to current energy crisis and European energy dependance on Russia, 70% of total capacity is offline for certain products (Bloomberg)
- If Europe becomes net importer of fertilizer, what does this mean to global demand?
  - World loses:
    - 8 million tons of urea production per year
    - 5.1 million tons of UAN production per year
    - 13.5 million tons of Ammonia production per year

## European Fertilizer Industry Status and Capacity

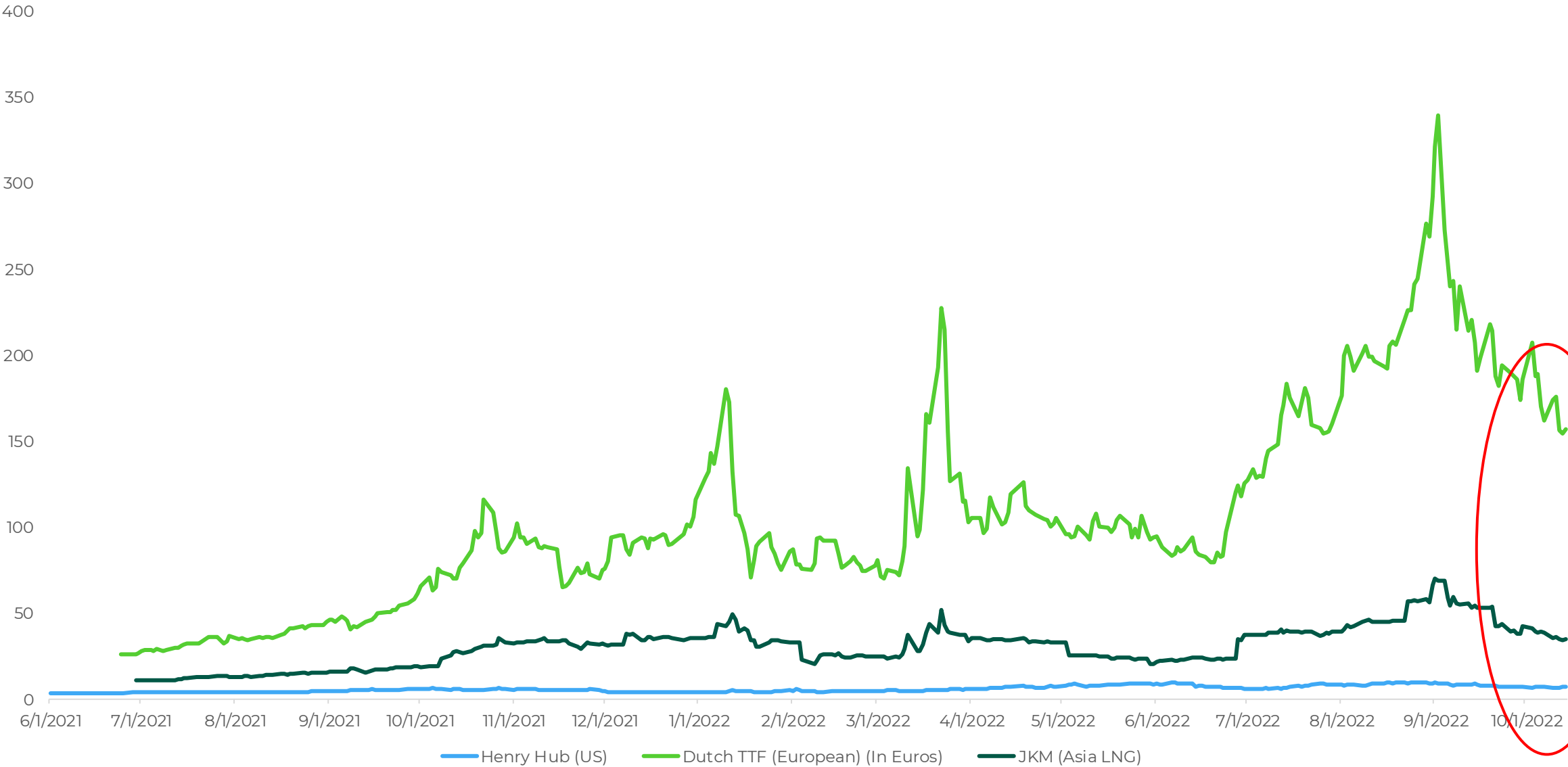


### Status (group)

- Offline, Offline September-October, Offline until end of September and 1 more
- Reduced rates, Reduced rates, producing some CAN, Reducing to 43% of operating capacity
- Running, Running at 8% of operating capacity, Running off imported ammonia and 2 more
- Shutting down nitrates and urea production; may run nitrates off imported ammonia in future

\*Values represent Total NH<sub>3</sub> capacity ('000 t/yr)

Global Natural Gas Prices (\$/MM BTU)



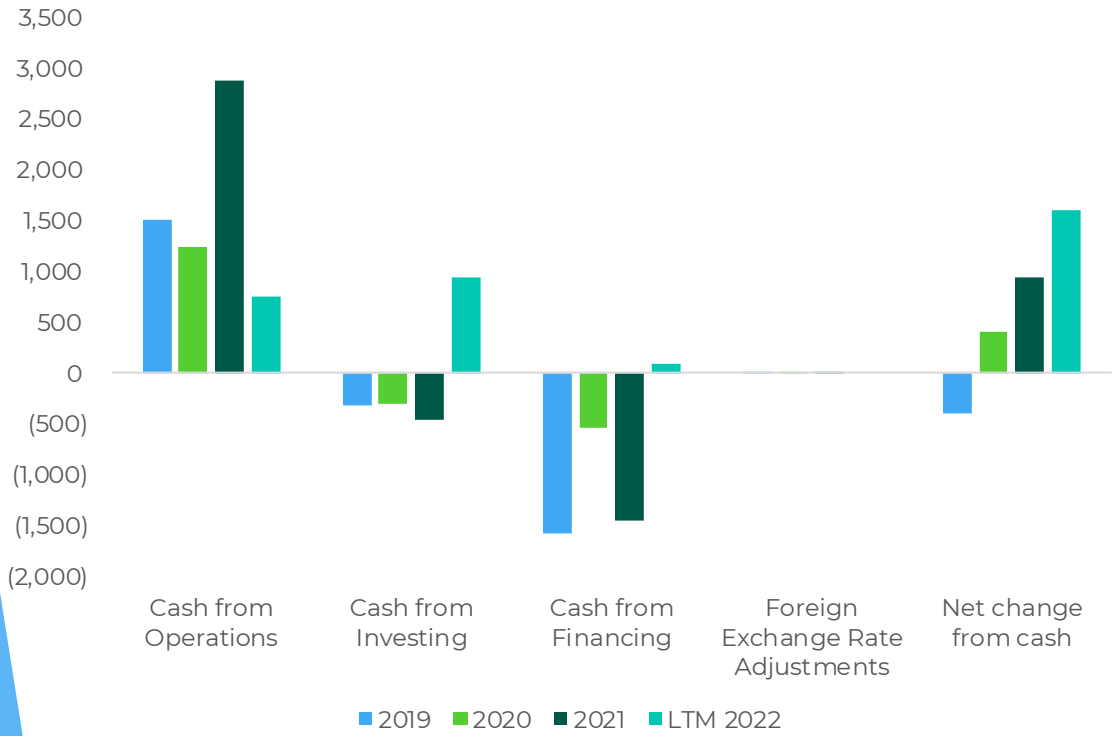


# Financial Analysis

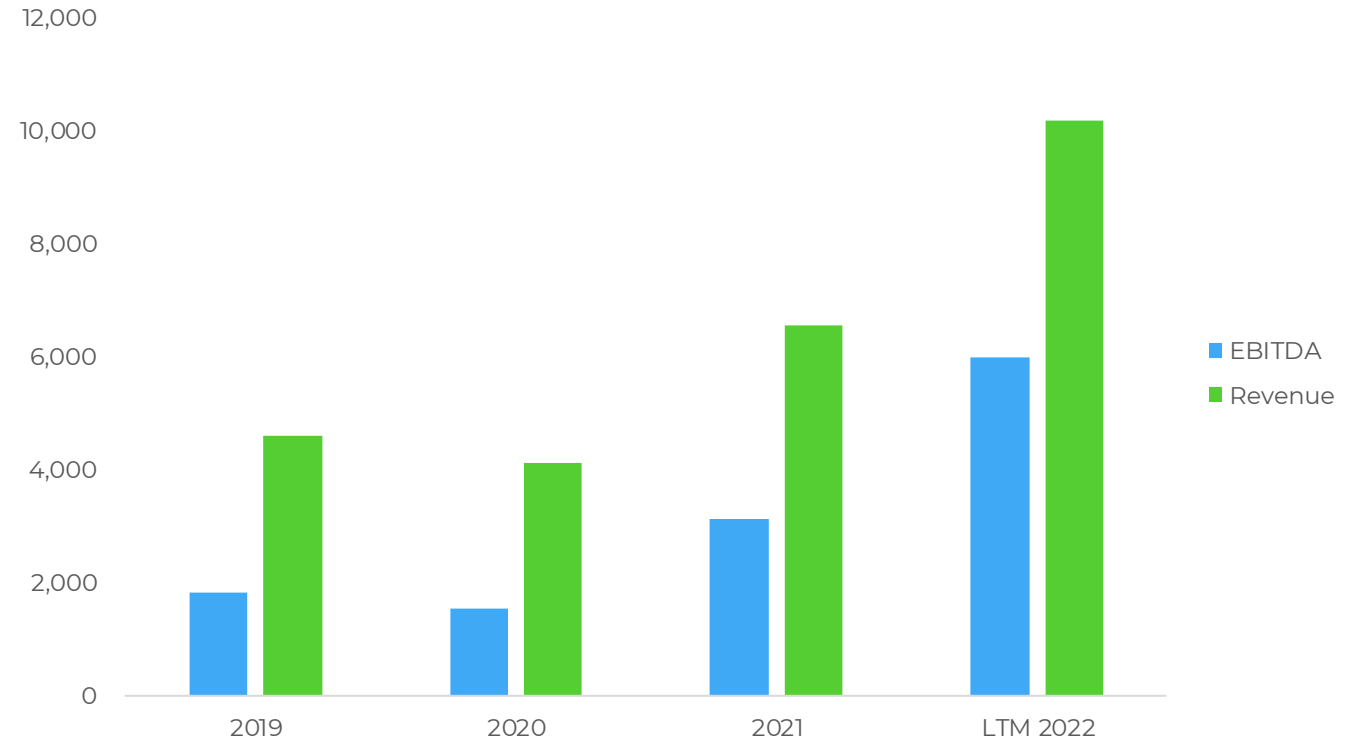


# Financial Analysis

CF Cash Flows

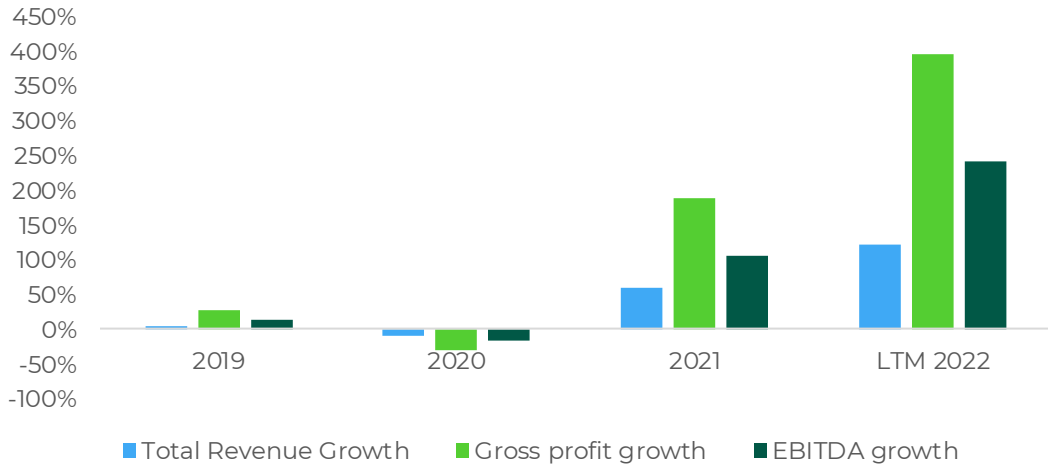


EBITDA and Revenues 2019-2022 (in millions \$)

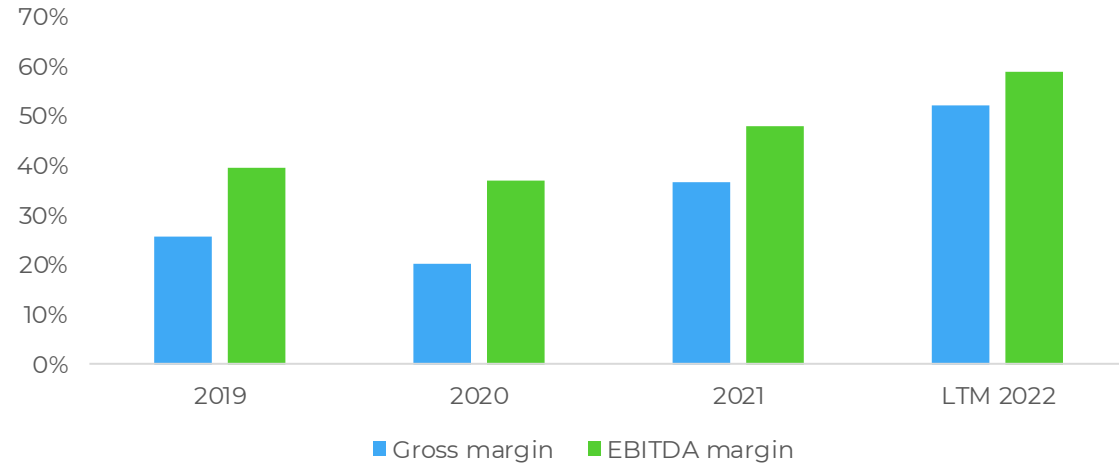


# Financial Analysis (cont.)

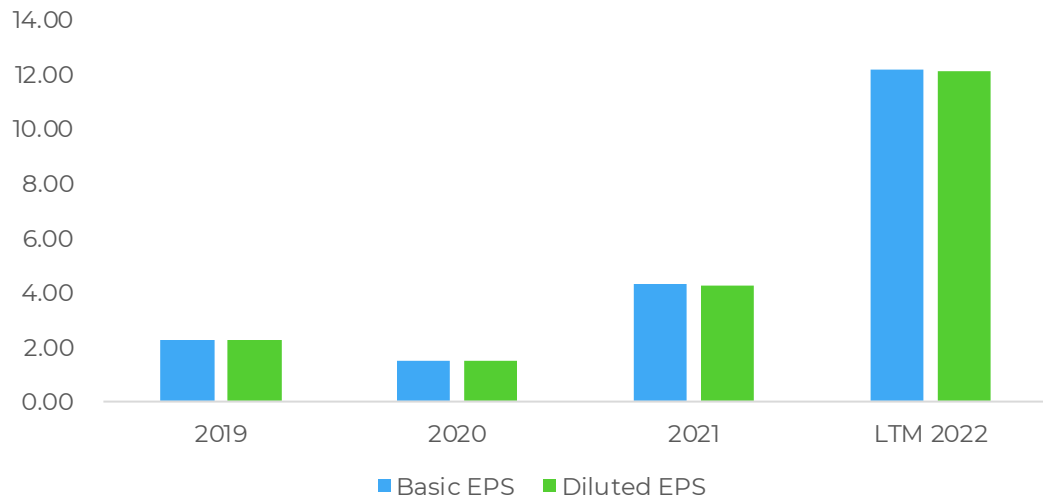
Growth of selected metrics YoY



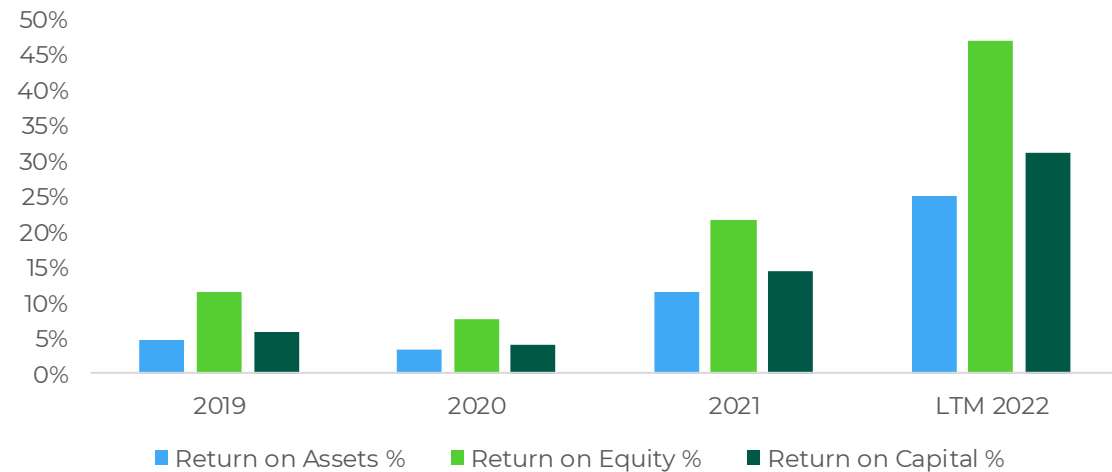
Gross and EBITDA Margins



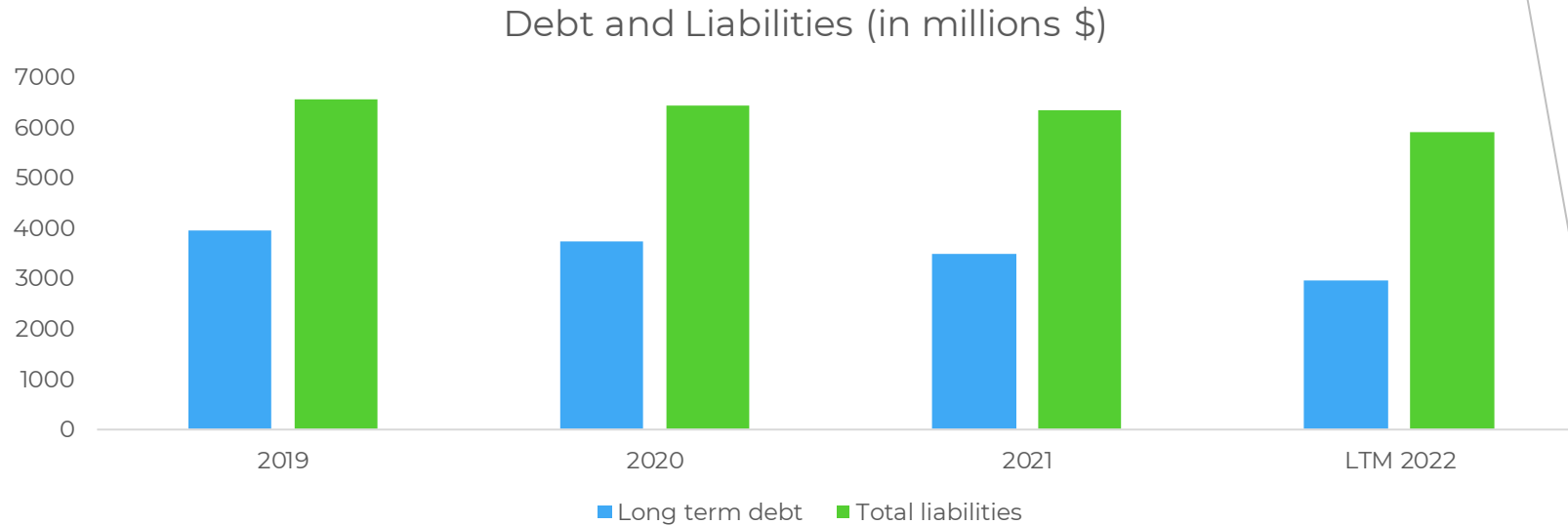
EPS 2019-2022



Return of selected metrics; YoY



# Financial Analysis (cont.)



## Latest Issued Securities

Maturity Date	Issuer	Security Type	Seniority	Coupon	Offer Date	Amt. Outstdg. (\$mm)	Current Price	Current YTW	S&P Rating
Dec-01-2026	CF Industries, Inc.	Corporate Debentures	Senior Secured	4.5	Nov-21-2016	750	94.549	6.011	BBB
Dec-01-2026	CF Industries, Inc.	Corporate Debentures	Senior Secured	4.5	Nov-10-2016	750	94.549	6.011	BBB
Dec-01-2026	CF Industries, Inc.	Corporate Debentures	Senior Secured	4.5	Nov-10-2016	750	94.549	6.011	BBB
Mar-15-2034	CF Industries, Inc.	Corporate Debentures	Senior Unsecured	5.15	Mar-06-2014	750	89.33	6.487	BBB
Mar-15-2044	CF Industries, Inc.	Corporate Debentures	Senior Unsecured	5.375	Mar-06-2014	750	84.073	6.797	BBB



# Valuation



# Comparable Companies Analysis

## Comparable Companies Select Universe

Company Name	Share Ticker	Share Price	Shares Outstanding	Market Capitalization	LTM Net Debt	Minority Interest	Total Enterprise Value	LTM Total Revenue	LTM EBITDA	EV/EBITDA	LTM EPS	P/E
Nutrien	NTR	86.3	538.9	46,490.9	10,992.0	44.0	57,526.9	34,612.0	10,992.0	5.2	12.29	7.0
Corteva	CTVA	63.0	718.6	45,235.9	(660.0)	240.0	44,815.9	16,703.0	3,790.0	11.8	2.36	26.7
Sociedad Quimica y Minera de Chile	SQM	86.4	285.6	24,667.3	9.3	35.3	24,711.9	6,364.5	3,293.8	7.5	7.29	11.8
Mosaic	MOS	52.0	345.3	17,955.6	3,294.9	157.7	21,408.2	16,555.0	5,575.0	3.8	8.80	5.9
FMC	FMC	116.5	126.0	14,681.5	3,432.9	18.8	18,133.2	5,410.7	1,384.2	13.1	5.45	21.4
Yara International	YAR	39.2	254.7	9,991.9	3,451.0	15.0	13,457.9	21,898.0	4,028.0	3.3	5.91	6.6
<b>High</b>		116.5	718.6	46,490.9	10,992.0	240.0	57,526.9	34,612.0	10,992.0	13.1	12.29	26.7
<b>Low</b>		39.2	126.0	9,991.9	(660.0)	15.0	13,457.9	5,410.7	1,384.2	3.3	2.36	5.9
<b>Average</b>		73.9	378.2	26,503.8	3,420.0	85.1	30,009.0	16,923.9	4,843.8	7.5	7.02	13.2
<b>Average of MOS + NTR</b>		69.1	442.1	32,223.3	7,143.5	100.9	39,467.6	25,583.5	8,283.5	4.5	10.55	6.5
<b>CF Industries</b>	CF	107.0	199.3	21,331.1	828.0	2,925.0	25,084.1	10,159.0	5,987.0	4.19	12.14	<b>8.8</b>

# Comparable Analysis (cont.)

Comparable Companies Valuation Range								
<b>EV/EBITDA Multiples</b>	<b>7.5x</b>	<b>4.5x</b>	<b>3.3x</b>	<b>Selected Multiples</b>	<b>13.20x</b>	<b>6.50x</b>	<b>5.90x</b>	<b>8.82x</b>
<b>New Enterprise Value</b>	44,744.95	26,941.5	20,003.06	<b>LTM NI</b>	2,568.00	2,568.00	2,568.00	2,568.00
<b>Debt</b>	828.00	828.00	828.00	<b>Equity Value</b>	33,897.60	16,692.00	15,151.20	22,649.76
<b>Cash</b>	2,370.00	2,370.00	2,370.00	<b>Shares Outstanding</b>	199.30	199.30	199.30	199.30
<b>Equity Value</b>	46,286.95	28,483.50	21,545.06	<b>Value Range</b>	170.08	83.75	76.02	113.65
<b>Shares Outstanding</b>	199.30	199.30	199.30	<b>Current Price</b>	107.00	107.00	107.00	107.00
<b>Fair Price</b>	232.25	142.92	108.10					
<b>Current Price</b>	107.03	107.03	107.03					
<b>Premium</b>	116.99%	33.53%	1.00%	<b>Premium</b>	58.96%	-21.73%	-28.95%	6.21%

# Dividend Discount Model

## Dividend Discount Model

### Two Stage Growth Model

		k / terminal g	3.50%	4.00%	4.50%	5.00%	5.50%	6.00%	6.50%
Stage 1 Growth Rate	25.00%								
Number of Years in Stage 1	5	<b>7.42%</b>	\$66.03	\$74.58	\$86.05	\$102.27	\$126.93	\$168.96	
Stage 2 Growth Rate	5.00%	<b>7.92%</b>	\$58.37	\$64.86	\$73.25	\$84.52	\$100.43	\$124.64	\$165.90
Number of Years in Stage 2		<b>8.42%</b>	\$52.27	\$57.35	\$63.72	\$71.96	\$83.02	\$98.64	\$122.41
Stage 3 Growth Rate		<b>8.92%</b>	\$47.30	\$51.37	\$56.35	\$62.61	\$70.69	\$81.55	\$96.89
Growth Path	Linear	<b>9.42%</b>	\$43.17	\$46.49	\$50.48	\$55.37	\$61.52	\$69.46	\$80.11
Cost of Equity Capital	8.92%	<b>9.92%</b>	\$39.69	\$42.44	\$45.69	\$49.61	\$54.42	\$60.45	\$68.25
Dividends per share, LTM	\$1.40	<b>10.42%</b>	\$36.71	\$39.02	\$41.72	\$44.92	\$48.77	\$53.49	\$59.41

Average **\$70.92**

FCFE Model with k at 8.92% and terminal growth at 6% = \$81.55 share price

# Free cash flow to equity model

<b>Free Cash Flow Model</b>									
Two Stage Growth Model									
Stage 1 Growth Rate	5.00%								
Number of Years in Stage 1	3								
Stage 2 Growth Rate	0.00%								
Number of Years in Stage 2									
Stage 3 Growth Rate		<b>k / terminal g</b>	<b>-1.50%</b>	<b>-1.00%</b>	<b>-0.50%</b>	<b>0.00%</b>	<b>0.50%</b>	<b>1.00%</b>	<b>1.50%</b>
Growth Path	Linear	<b>6.77%</b>	\$218.81	\$231.12	\$245.12	\$261.20	\$279.83	\$301.70	\$327.72
Cost of Equity Capital	8.92%	<b>7.27%</b>	\$206.00	\$216.81	\$229.00	\$242.88	\$258.80	\$277.27	\$298.93
Free Cash Flow, LTM	\$3,258.80	<b>7.77%</b>	\$194.58	\$204.13	\$214.84	\$226.92	\$240.66	\$256.44	\$274.73
		<b>8.27%</b>	\$184.33	\$192.82	\$202.28	\$212.89	\$224.86	\$238.48	\$254.11
<b>For FCF and FCFE models only:</b>		<b>8.77%</b>	\$175.07	\$182.67	\$191.09	\$200.46	\$210.97	\$222.83	\$236.33
Total Debt (\$ millions)	\$3,198.00	<b>9.27%</b>	\$166.68	\$173.51	\$181.04	\$189.37	\$198.67	\$209.08	\$220.83
Cash (\$ millions)	\$2,370.00	<b>9.77%</b>	\$159.03	\$165.20	\$171.96	\$179.42	\$187.69	\$196.89	\$207.21
		Average							
Shares Outstanding (millions)	199.30	<b>\$219.25</b>							
Weighted Average Cost of Capital (%)	8.27%								

FCFE Model with k at 9.77% and terminal growth at 0% = \$179.42 share price





# Valuation

Valuation Considerations:	Multiple	Price	Weight
Comparable Analysis (EV/EBITDA)	4.5x	142.92	25%
Comparable Analysis (P/E)	9x	115.97	25%
Discount Dividend Model		81.55	25%
Free Cash Flow to Equity		179.42	25%

Blended price: \$129.38 or 31.3% premium



# Investment Risks

# Investment Risks

## Economic

- Global recession reduces demand significantly
- Natural gas prices
- Inability to execute expansion plans

## Geopolitical

- Resolution to energy crisis and aftermath of Russian-Ukrainian war
- Chinese players re-entering market
- Currency differences squeeze certain buyers out of the market

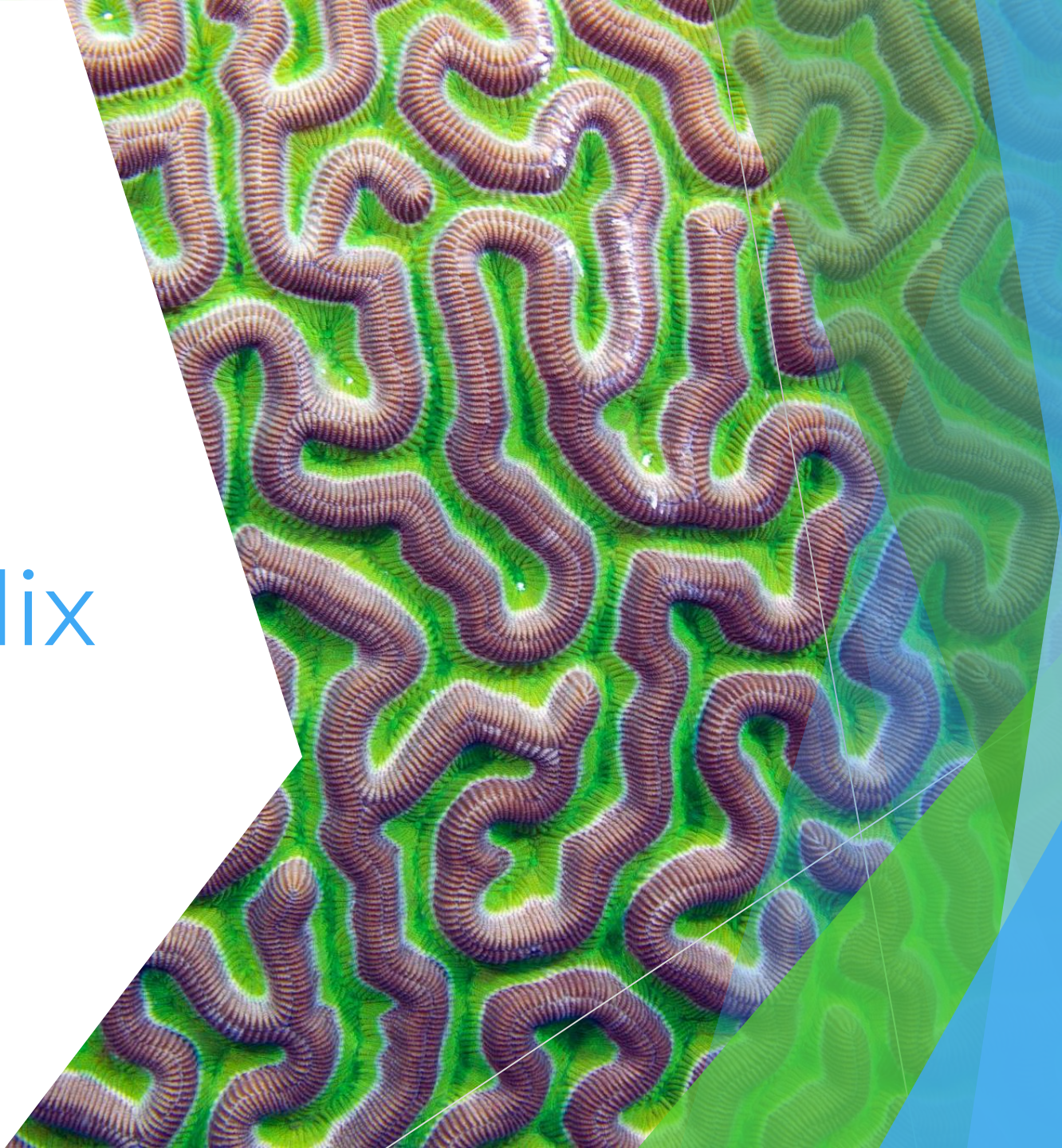
## Climate

- Worse than expected crop yields and projected dry weather
- Reduced usage and inability to apply fertilizer due to the above
- Transportation issues in the event of low water levels in the Missouri and Mississippi

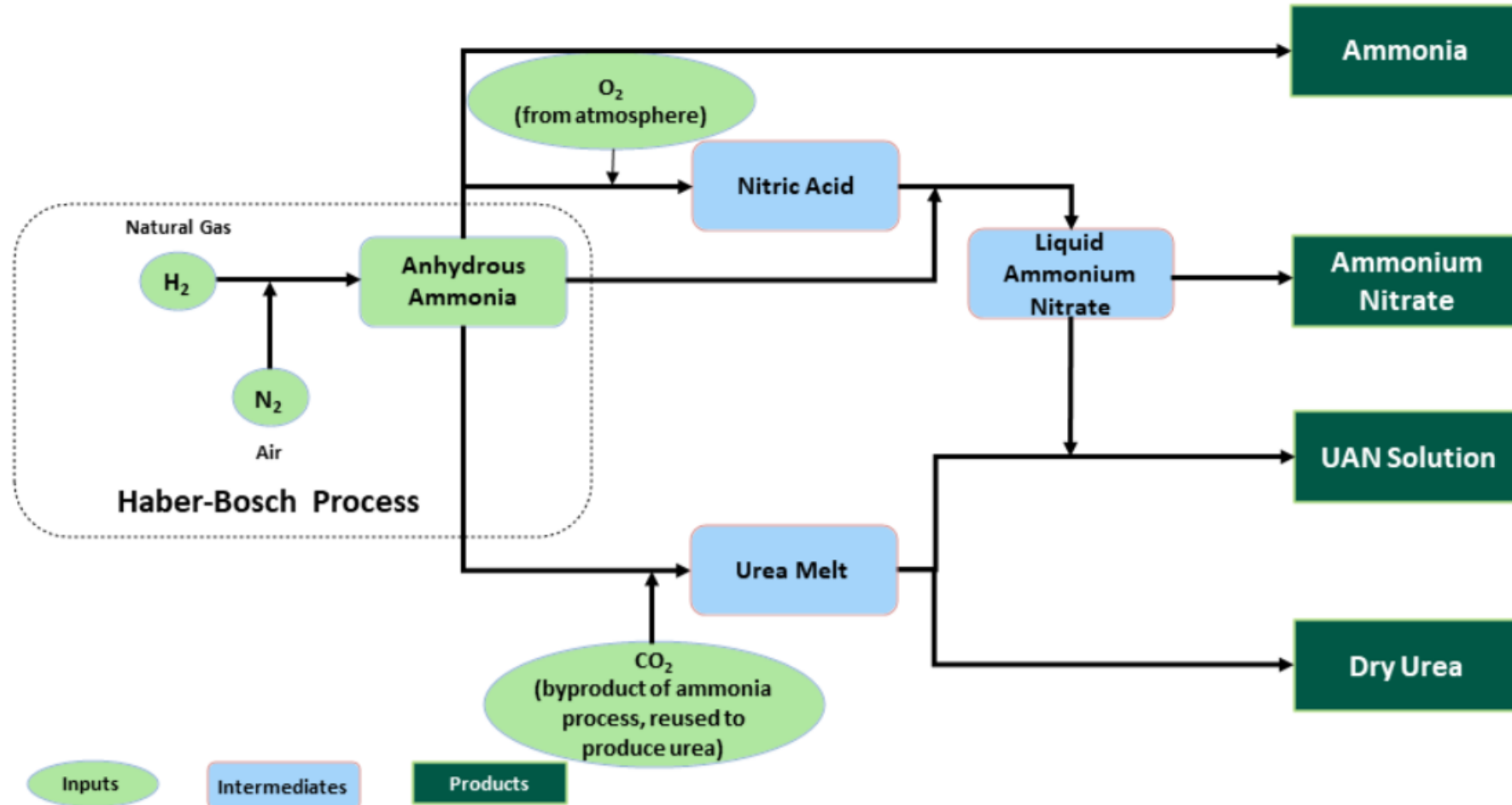
## Regulatory

- Reduction of current dumping legislation
- Strict green house gas (GHG) regulations to reduce emissions would fundamentally change the business

# Appendix



# Manufacturing Process for CF Industries Products

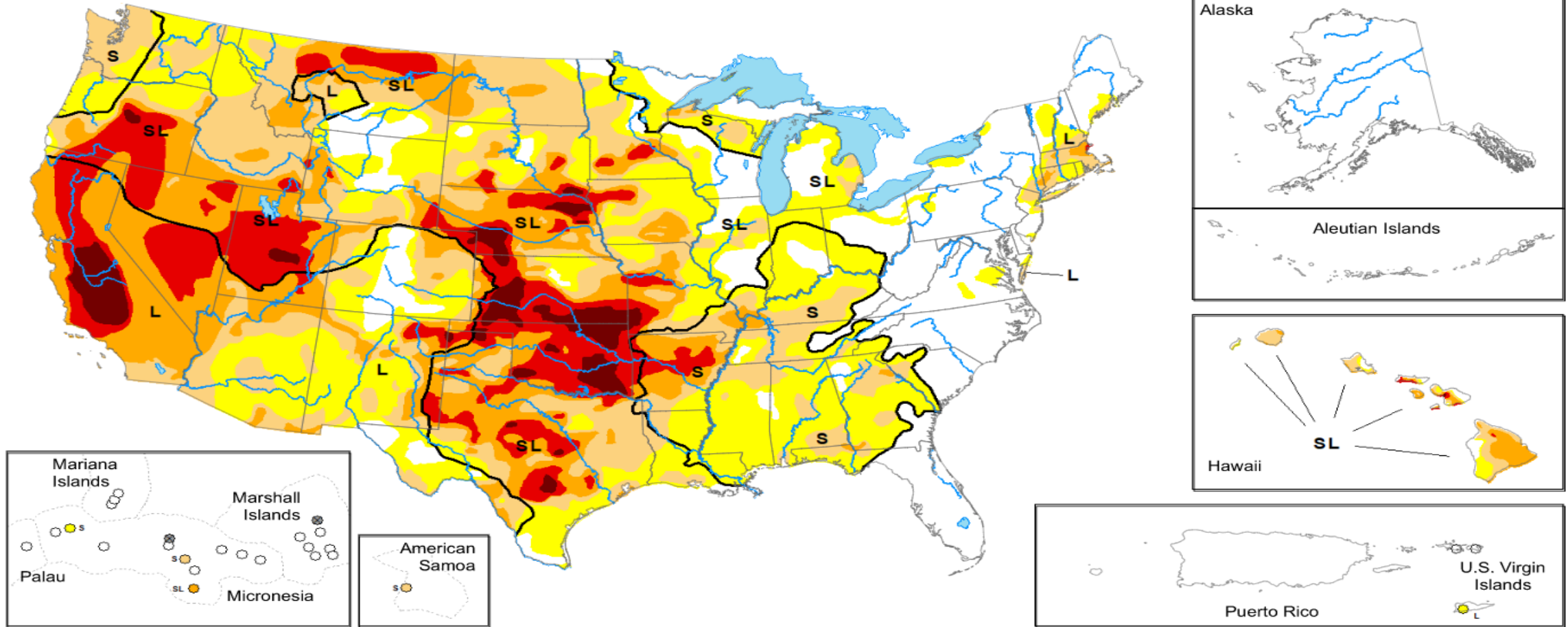


Source: CF Industries website



Map released: October 13, 2022

Data valid: October 11, 2022



Source: University of Nebraska - Lincoln

Sources:

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ibisworld.com

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