CF INDUSTRIES (NASDAQ: CF)
Final Report

UNIVERSITY OF CONNECTICUT

STUDENT MANAGED FUND

TEAM BLUE 2022-2023

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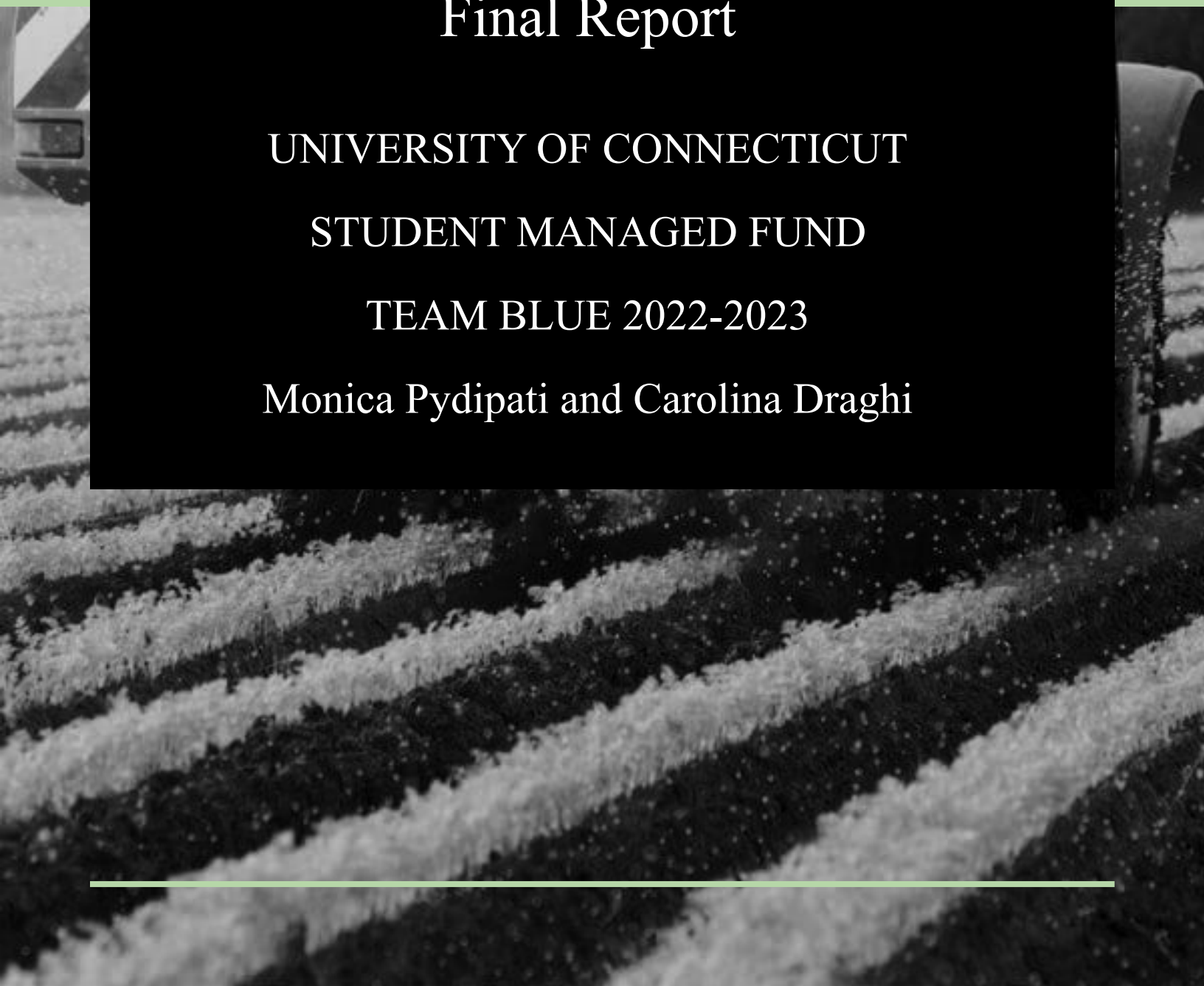

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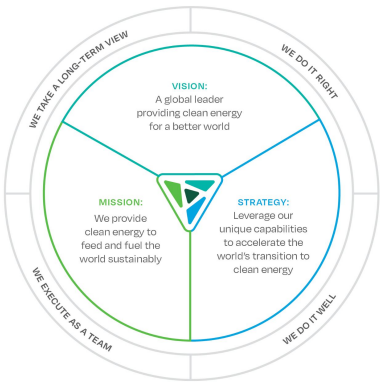
REPORT HIGHLIGHTS

Purchase Price	*Target Price*	*Current Price*	*52 Week Range*	*P/E*	*Market Cap.*	*Div. Yield*
$85.59	**$107.66**	**$76.83**	**67.95 - 119.60**	**4.69**	**$15.055B**	**2.17%**

**Note : Stock was stopped out at $70 during the investment period. In retrospect, a lower stop/loss value of $60 should have been implemented to account for natural fluctuations in the stock's price due to the cyclical nature of the industry. Highlights are based on a situation in which the lower $60 stop/loss value would have been implemented.*

INVESTMENT THESIS

Our investment thesis is based on the great growth that CF has shown in the past few years with heightened fertilizer prices and the potential for future growth with prevailing high prices, as well as the initiatives the company is taking to expand their supply mix to utilize more ammonia components.



Being a basic materials company focused on providing farmers with better fertilizer for growing crops, CF is positioned in an industry that will always see demand. While there is certainly volatility associated with macroeconomic market conditions, many uncontrollable, the need for fertilizer will be ever present due to the basic need for food.

CF has a globally efficient supply chain system and very flexible manufacturing facilities that not only allows them to quickly change their product mix to fit the needs of their customers and ongoing product mixes, but they are also able to determine the best course of action in regards to transport of their products. With worldwide supply and demand all integrated together, CF has the capability to suit their customer's needs anywhere almost perfectly.

While short term growth was fueled primarily by higher fertilizer prices, long term growth is likely to continue seeing greater demand for ammonia products. Companies see the potential for ammonia in multiple industries, from fertilizer to plastic manufacturing to power generation. Combined with the greater focus of CF on green and blue ammonia, which will expand the company's product offerings, CF is primed for long term growth.

While CF is subject to rising global energy prices, it is able to evade the intense effects of it compared to its European competitors due to the lower natural gas prices found in the US. CF also is the largest producer of ammonia in the world, and has stakes in both hydrogen and nitrogen, which are critical fertilizer components. These give the company an advantage over other fertilizer companies that are focused on potash and phosphate.

COMPANY OVERVIEW

CF Industries is a global manufacturer and distributor of hydrogen and nitrogen products for use in clean energy, fertilizer, emissions abatement and other industrial applications. They are the world's largest producer specializing in the production of ammonia, sold either as ammonia or upgraded to urea, urea ammonium nitrate, ammonium nitrate, or diesel exhaust fluid, with a total average annual capacity of 10.5 million tons of ammonia.

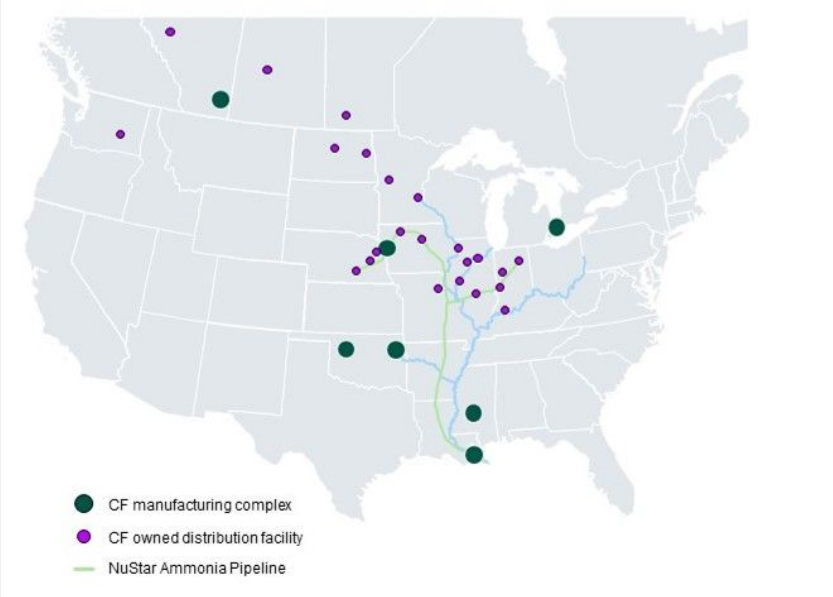
The use of nitrogen in fertilizers dramatically improves food production and food yield, allowing for more high-quality crops to be grown on fewer acres. The lesser use of land area for crops increases the land area for forests and wildlife. The fertilizer also helps emissions control, helping to offset global greenhouse gas emissions by sequestering/naturally capturing CO2.

CF distributes globally, but their production takes place primarily in America, the UK, Canada, and the Caribbean, each area accounting for 7,825,000, 590,000, 1,730,000 and 360,000 tons of production annually. Their Louisiana plant, accounting for 4,335,000 annual tons, is the largest ammonia production complex in the world.

With the world shifting to decarbonization, hydrogen has been identified as a leading candidate for scalable clean energy sourcing. Since ammonia does not emit carbon when burned and can be transported easily and safely, it is seen as a vehicle to deliver hydrogen for clean energy. While hydrogen currently only meets 1% of the world's demand for energy, this is predicted to increase to 20% by 2050.

OPERATIONS MANAGEMENT

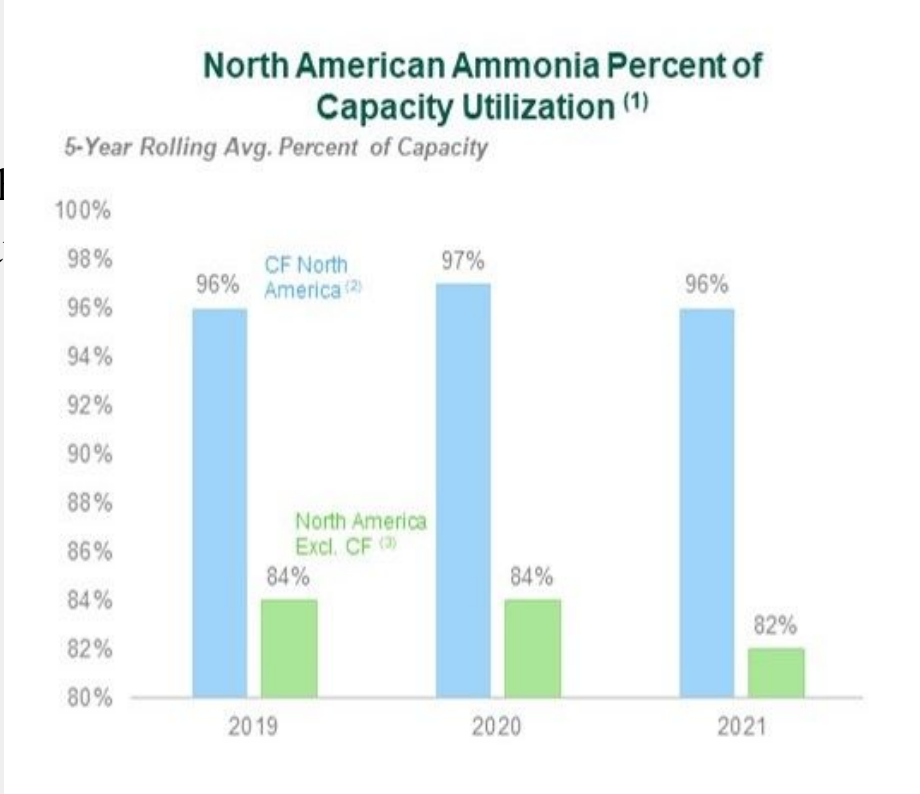
CF hosts 9 manufacturing companies and 24 distribution centers worldwide. Since it can be extremely expensive to shut down and restart the manufacturing plants, the plants continue to run 24 hours a day. This has helped the company better understand production system design, planning and scheduling, and predictive and preventive maintenance. However, more important than simply manufacturing the product, the company puts extensive effort in their distribution capabilities, making sure farmers have what they need when they need it.



The company is able to efficiently use its management and distribution networks to serve its customers. Its distribution network consists of extensive storage, multimode transportation, and extensive logistics. The network houses 3.2 million tons of storage capacity throughout 24 distribution facilities. All North American complexes have access to Class 1 railroads, along with global access to deepwater vessels, barges, rails, trucks and pipelines. The operational management of the company allows for efficient transportation.

OPERATIONS MANAGEMENT

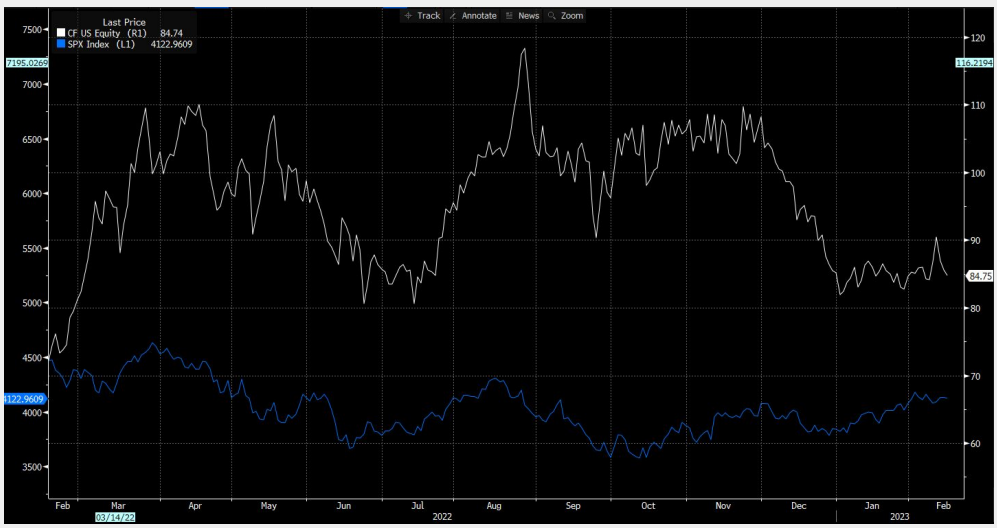
The company also boasts high asset utilization capabilities a levels approximately 14% higher than North American competitors, allowing for roughly 1.3 million tons of incremental gross ammonia per year.



CF also has one of the most flexible manufacturing networks. They are able to produce roughly 10 million tons of ammonia per year, and optimize their product mix in the form and location that maximizes margins. For example, depending on the situation, manufacturing facilities are able to switch between producing granular urea and urea ammonium nitrate within minutes.

Compared to competitors, CF is able to store product strategically along major rivers, roads, and rail lines and lease storage capacity in a specific market to have product available when it's needed. They use the overall cost of delivery per ton per mile to employ the most efficient means available. Recently, the company has implemented enterprise resource planning (ERP) tools, partnering with SAP to take advantage of predictive analytics.

HISTORICAL PERFORMANCE



Looking at CF's performance over the past year, it can be seen that the company tends to perform better than many of its peers within the fertilizer industry. Its performance against the overall fertilizer industry looks fairly strong, although it has failed to keep up with it over the past few months. However, we are projecting that the company will be able to ramp up production and do better or similar to the overall industry in the coming months, contributing to an increase in the price of the stock.

SHORT-TERM OVERVIEW

01 | PANDEMIC

The fertilizer industry can be quite unstable, as its performance is dependent on energy economics, government policy (in the case for nitrogen) and the presence of mineral deposits (for phosphate and potash). The markets follow a commodity cycle based on supply and demand, with high levels of global integration. 2022 saw a multitude of factors that affected the demand for fertilizer, causing an incredible increase in its price.

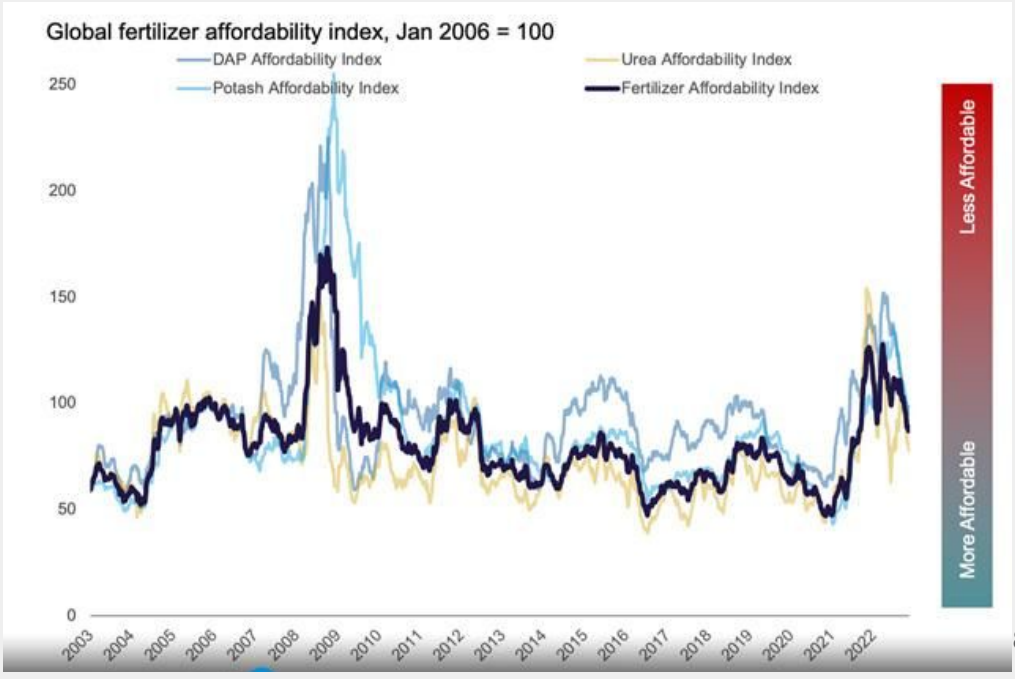
The pandemic caused a shutdown in manufacturing and shipping, as there were less people available to do the work. This caused a slowdown in supply, but the demand for food never stopped, causing an increase in fertilizer prices.

02 | CHINA

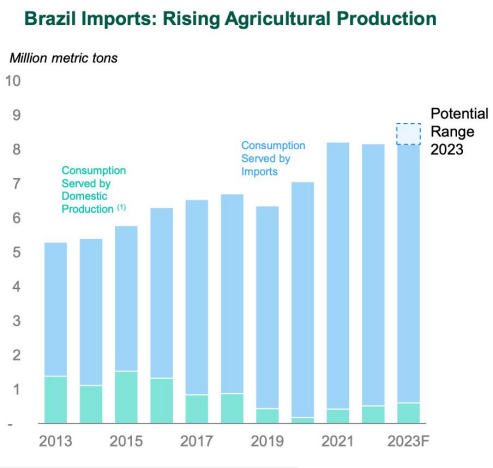
China has begun to import greater amounts of fertilizer, alongside other goods, due to its growing population. While the country recently saw the first dip in its population growth, the country continues to need to meet the demand of its residents. The increased demand from China for fertilizer causes higher fertilizer prices, supporting the profits of fertilizer manufacturers.

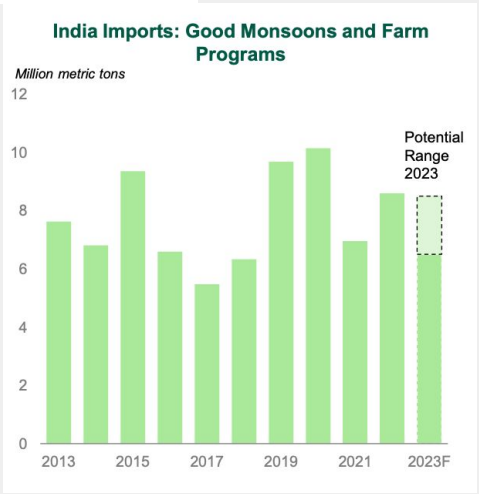
03 | RUSSIA/UKRAINE

The Russia-Ukraine war also posed a significant situation for fertilizer companies. The war caused a serious lack of supply from Russia, Belarus, and Ukraine to Europe and China. This caused demand to look for other sources of fertilizer, and the lowered supply combined with greater demand caused an incredible increase in prices.



LONG-TERM OVERVIEW





Looking at the long term prospects for ammonia, the ammonia market is expected to reach 116 billion USD by 2030, from 82.2 billion USD in 2022, at a CAGR of 4.4%. The Asia-Pacific region is the largest market as well as the fastest-growing market for ammonia, followed by North America and Europe. The growing demand for fertilizers from China and India is expected to drive the growth of the ammonia market during this time, as the two countries continue to import large amounts of crops and agricultural products to meet the demand of its immense populations.

The fertilizer industry is the largest consumer of ammonia, accounting for over 80% of the total demand. The growing population and the need for food security are the major drivers for the demand for fertilizers. The increased demand for urea and other nitrogenous fertilizers is expected to drive the growth of the global ammonia market.

Additionally, urea is also used as a raw material in manufacturing several chemicals, such as adhesives, resins, and plastics, boosting ammonia demand.

Another driver influencing market growth is the growing demand for ammonium nitrate (AN) from end-use industries such as construction and mining. AN finds applications in these industries as an explosive

material and blasting agent. The expansion of these industries will lead to an increase in demand for AN, which will consequently drive the growth of the ammonia market during the forecast period.

The major drivers that are influencing growth in this market are the increased use of ammonia in power generation and rising environmental concerns over carbon emissions.

Fertilizer stocks are a good investment as they're necessary for food production. While prices will likely settle in the long run, what is certain is that there will always be some event that puts pressure on crop production and results in high stock prices for fertilizer once again.

COMPETITION

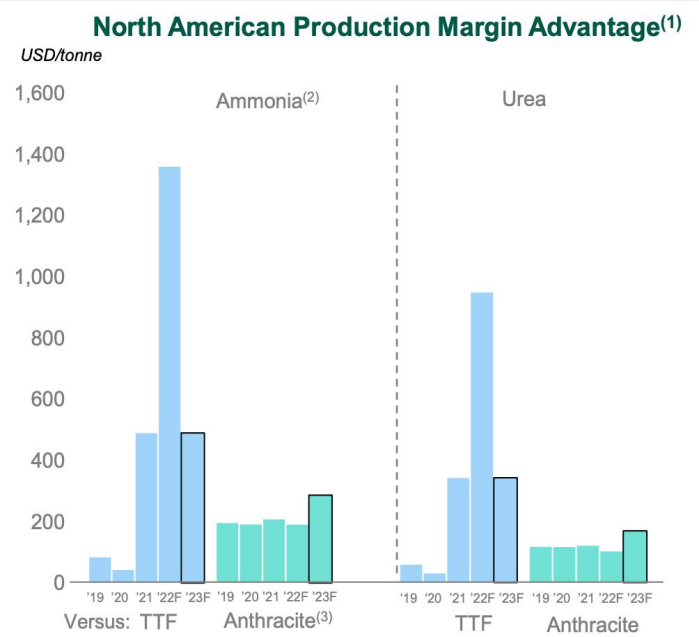
CF faces competition from other fertilizer companies, other agricultural products manufacturers, and agriscience companies. Mosaic is its most direct competitor, mining phosphate and potash, and collecting urea for fertilizer. Potash and phosphate fertilizers are also heavily sought after, but CF industries do not work with either material. The other companies all focus on different aspects of fertilizer production and agriscience and agribusiness, posing competition for CF. However, CF continues to be the world's largest producer of ammonia, using the chemical in various forms and expanding beyond the fertilizer market.

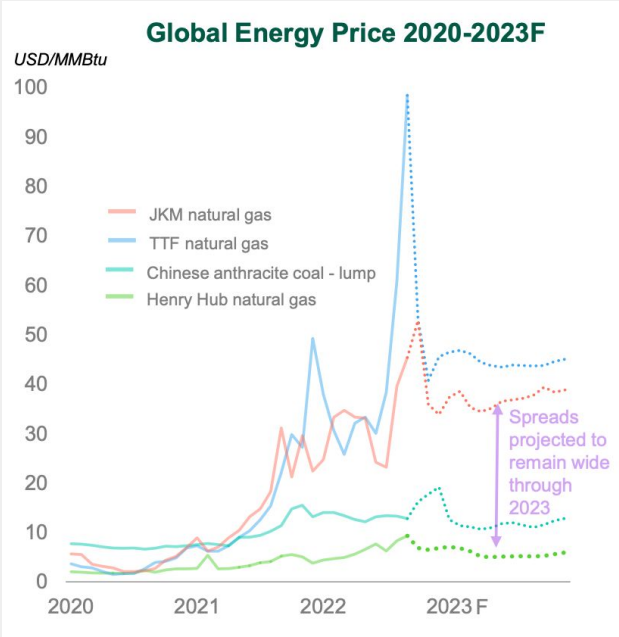
With demand for fertilizer not slowing and an estimated annual compound growth rate of 4.4%, the industry proves to be a potentially strong long-term investment.

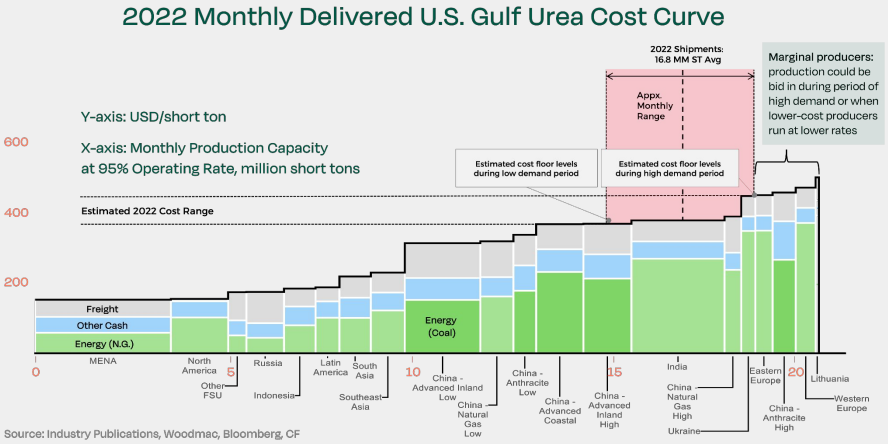
COMPETITIVE ADVANTAGE

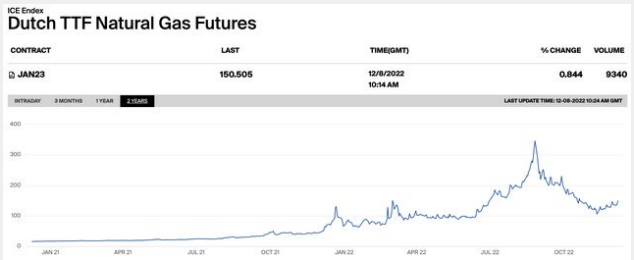
The prices of nitrogen fertilizers and urea have relentlessly grown higher from 2021-2022, and are currently the highest they've been in almost 15 years. Since CF has production plants primarily in America, with Canadian and Trinidadian plants as well, they were able to evade many of the immediate supply chain and gas issues that arose with the Russia-Ukraine war in contrast to many other companies with plants primarily in Europe. Even without the war, the cost of natural gas in Europe is much higher than the US since the US is a relatively large natural gas producer, so CF enjoys comparatively lower input costs, giving it both pricing power and relatively higher margins. The war exacerbated these prices, causing U.K. natural gas prices to dramatically increase. Currently, U.K. gas prices are still priced about 7x above U.S. levels. These prices are unlikely to normalize. During 2022, Europe was still supported by Russian gas flows to boost gas inventories, albeit lessened significantly. However, those inventories are expected to be highly rationed to evade total depletion in 2023, and boosting those inventories will be difficult. European ammonia producers therefore face much higher input cost pressure, which means CF should benefit in the forthcoming years.

Being a leading manufacturer of hydrogen and nitrogen, both critical fertilizer components, CF is primed for great increases in long-term prices and growth. The company saw a revenue increase of 58.5% from the 2020 to 2021. The company believes it will take many years to replenish global grain supplies, so it expects to see continually better results for a while.

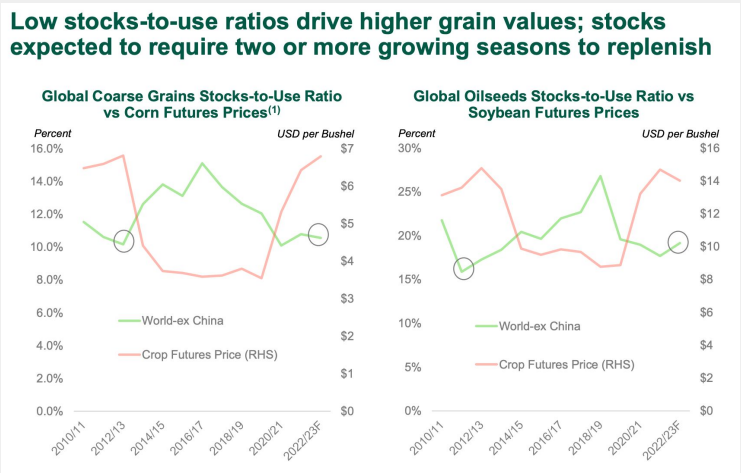








Higher natural gas prices in Europe allows CF to gain a considerable margin advantage.



The company believes it will take many years to replenish global grain supplies, allowing for potentially continuously better results for a while.

SHAREHOLDER VALUE

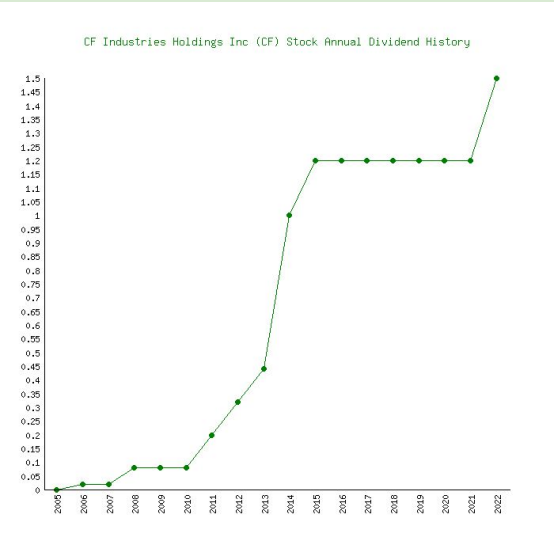
CF does pay dividends, and has a history of doing so while increasing them. Over the last three years, CF's dividend payouts have grown at a 7.7% CAGR. While the growth of dividends can be sporadic, seen by the plateau from 2015 to 2021, it has consistently paid out dividends. Currently, the company pays a quarterly dividend of $0.40 per share.

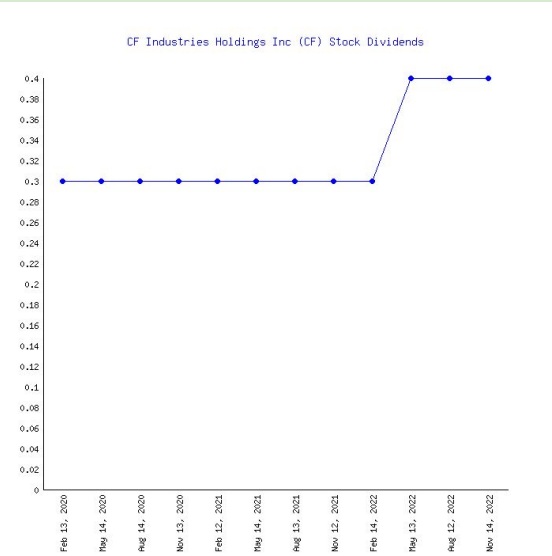
CF has a strong cash position, which is a good thing for heavily cyclical sectors such as this. If and when the trend changes and fertilizer demand or prices drop, the company would need lots of cash as a management team, as it provides greater ability to buy more stock and reduce the share count, or buy distressed assets in the industry or even do full scale acquisition at bargain prices.

If fertilizer prices stay elevated, CF is also better positioned to reward shareholders more generously compared with its peers. While CF does not have a long history of buybacks, it has recently authorized a $3 billion share repurchase program through the end of 2025. This has already gone into effect, with 2.2 million shares being repurchased at the end of 2022. This program can create great value given how much cash fertilizer companies have accumulated on their balance sheet in the past 18 months.

CF has used some of its strong cash balances to offset long term debt. As at June 30, 2022 it had long-term debt of $2.96 billion, a 14% reduction from $3.46 billion six months earlier on Dec 31, 2021. Retained earnings have nearly doubled from $20.88 billion on Dec 31 2021 to $37.29 billion on June 30 2022.

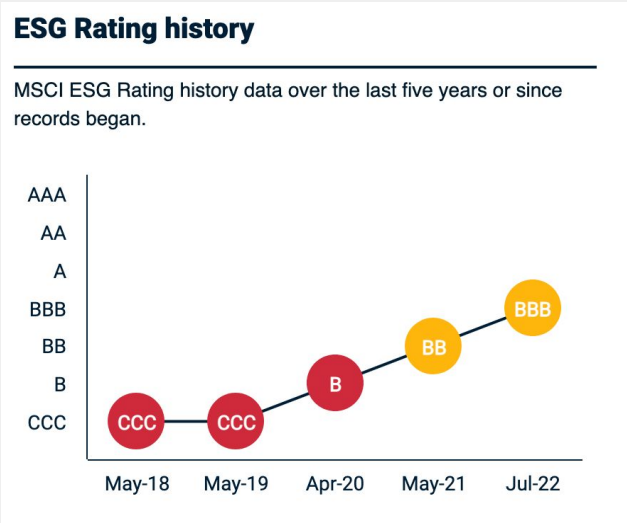
CF is therefore well positioned to generate greater shareholder value through share buybacks, its potential to generate cash at above-normal rates (as long as fertilizer prices stay elevated), and the fact that it has reduced long-term debt (and lowered their cash outflows).



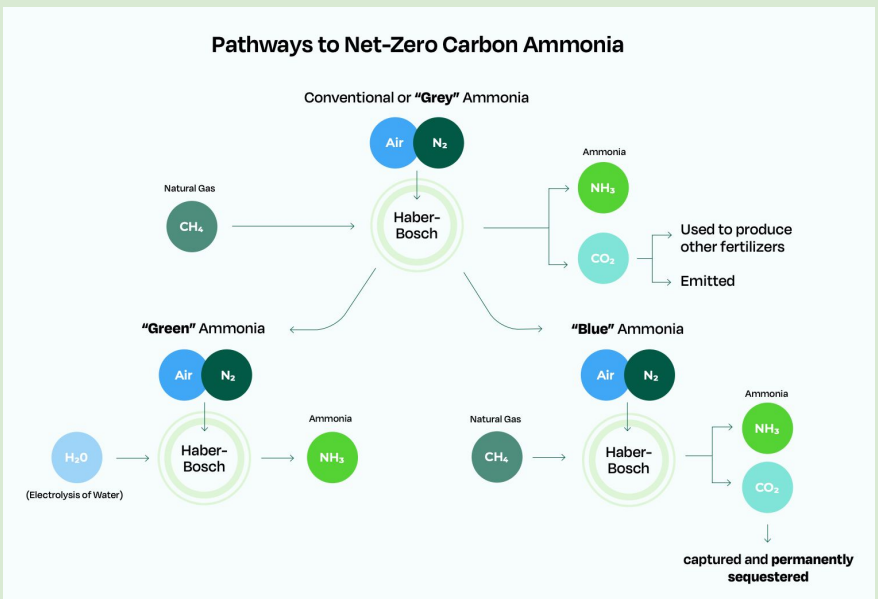


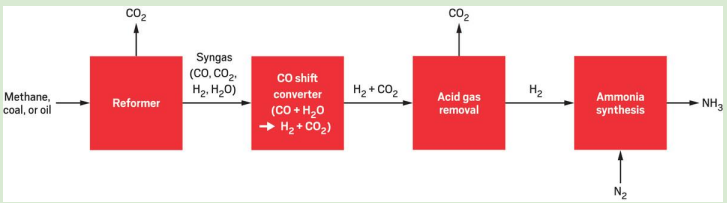
ESG RATINGS AND SOLUTIONS

Being an ammonia producer, CF does not have the best ESG rating due to the carbon amounts ammonia production emits. However, they are taking active steps to reduce the environmental effect their ammonia production has, something that not only helps the environment but shapes a better future for the company.



Ammonia production accounts for about 2% of total final energy consumption, virtually all of it from fossil fuels, resulting in a carbon dioxide (CO2) footprint equivalent to the total emissions of South Africa's energy system. Despite continued efficiency gains in fertilizer use, growing populations are expected to require greater ammonia production during a period when many governments around the world will be working on bringing their economies' emissions down. So while demand for ammonia rises, the world cannot afford the emissions that occur as a result of its production. CF has vowed to decarbonize their network through 'blue' and 'green' ammonia. This would mean producing ammonia from carbon-free sources (green ammonia) and ammonia produced conventionally with the CO2 byproduct captured and permanently sequestered (blue ammonia). The company has committed $385 million in capital through 2025 to advance these initiatives, with the goal of net-zero carbon emissions by 2050.





BLUE AND GREEN AMMONIA

In support of blue ammonia, CF has partnered with ExxonMobil and is investing $200 million to build a CO2 dehydration and compression unit at its biggest manufacturing plant in Louisiana. CF will store the excess CO2 byproduct, which ExxonMobil will then transport and permanently store in secure storage for later sequestration either geologically or biologically. Demand for blue ammonia itself is expected to grow significantly as a decarbonized energy source, both for its hydrogen content and as a fuel itself. The 2 million metric tons of emissions captured annually will be equivalent to replacing approximately 700,000 gasoline-powered cars with electric vehicles.

In regards to green ammonia, CF has begun construction on North America's first commercial scale green ammonia production facility. Once completed in 2023, CF will be able to produce up to 20,000 tons of green ammonia per year. Green ammonia is produced using hydrogen from water electrolysis and nitrogen separated from the air, resulting in a 100% renewable and carbon-neutral ammonia production process.

CF has signed an agreement with Japanese power giant JERA for the supply of 500,000 metric tons of clean ammonia beginning 2027. The clean ammonia will help JERA reduce their own carbon emissions. Additionally, in tune with their efforts to reduce the environmental damage of their production process, CF has recently entered into an agreement with oil and gas company BP to source 2.2 billion cubic feet of certified natural gas. This natural gas will lower the company's emissions by 90% during their ammonia production process, and reduce the lifecycle carbon intensity by up to 20%.

With the world looking to decrease the amount of carbon emissions released, green and blue ammonia production will certainly play a role in leading the world to net-zero emissions. While fertilizers primarily use the nitrogen component of ammonia, the hydrogen component will now become increasingly useful as blue ammonia. CF is at the forefront of this shift to environmentally sustainable ammonia production.

ENERGY

Energy Consumption Within the Organization	2021	2020	2019
Total natural gas consumption (MMBtus)	334,077,309	364,058,137	360,271,343
Total electricity consumption[1] (GJ)	8,826,534	9,164,812	9,288,805
% electricity procured from renewable sources	36	22	23
Energy Intensity			
	2021	2020	2019
Gas	352,470,220	384,104,233	380,274,368
Gross Ammonia Production (Metric Ton)	8,481,397	9,391,681	9,295,111
Energy Intensity	41.56	40.90	40.91
Reduction of Energy Consumption			
	2021	2020	2019
Reduction in natural gas consumption from prior year (GJ)	-29,981,828	-3,829,865	-13,929,302

1 Electricity consumption includes purchased and self-generated electricity

EMISSIONS

GHG Emissions Intensity				
	Denominator	2021	2020	2019
GHG emissions intensity Ratio	Gross Ammonia Production	1.99	1.81	1.97
Reduction Of GHG Emissions				
Unit: Tonnes	Denominator	2021	2020	2019
Total GHG reductions:	Type of GHG emissions that have been reduced Direct (Scope 1) Indirect (Scope 2)	1,390,069	467,835	-1,543,348
Direct (Scope 1) GHG Emissions				
		2021	2020	2019
Total CO2e Scope 1 Emissions (in million Tonnes CO_2e)		16.8	17.9	18.4
Scope 1 CO_2 (in million Tonnes CO_2e)		12.1	12.7	12.6
Scope 1 N_2O (in million Tonnes CO_2e)		4.5	5.1	5.7
Scope 1 CH_4 (thousand Tonnes CO_2e)		37.4	106.2	57.8
Energy Indirect (Scope 2) GHG Emissions				
		2021	2020	2019
CO_2e Scope 2 Emissions (Tonnes)		688,228	789,037	883,682
Other Indirect (Scope 3) GHG Emissions				
		2021	2020	2019
CO_2e Scope 3 Emissions (Tonnes)		53,370,000	59,230,000	-
Nitrogen Oxides (Nox), Sulfur Oxides (Sox) and Other Significant Air Emissions				
Unit: Tonnes		2021	2020	2019
Particulate matter		1,454	1,649	1,632
NO_x (Nitrogen oxides)		10,462	10,762	9,984
SO_x		29	28	29
VOCs (volatile organic compounds)		737	744	882
NH_3		8,162	8,777	10,384

VALUATION

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Revenue	$ 4,130	$ 4,429	$ 4,590	$ 4,124	$ 6,538	$6,877.98	$7,263.14	$7,662.62	$8,068.73	$8,488.31
% growth		7.2%	3.6%	-10.2%	58.5%	5.2%	5.6%	5.5%	5.3%	5.2%
Cost of Revenue	$ 3,696	$ 3,512	$ 3,416	$ 3,323	$ 4,551	$5,158.48	$5,665.25	$5,823.59	$6,051.55	$6,366.23
% margin	89.5%	79.3%	74.4%	80.6%	69.6%	75.0%	78.0%	76.0%	75.0%	75.0%
Gross Margin	$434.00	$917.00	$1,174.00	$801.00	$1,987.00	$1,719.49	$1,597.89	$1,839.03	$2,017.18	$2,122.08
gross margin %	10.5%	20.7%	25.6%	19.4%	30.4%	25.0%	22.0%	24.0%	25.0%	25.0%
Operating Expenses	$200.00	$151.00	$171.00	$178.00	$258.00	$ 309.51	$ 363.16	$ 421.44	$ 443.78	$ 466.86
% margin	4.8%	3.4%	3.7%	4.3%	3.9%	4.5%	5.0%	5.5%	5.5%	5.5%
EBIT	$234.00	$ 766.00	$ 1,003.00	$ 623.00	$ 1,729.00	$ 1,409.99	$ 1,234.73	$ 1,417.58	$ 1,573.40	$ 1,655.22
% margin	5.7%	17.3%	21.9%	15.1%	26.4%	20.5%	17.0%	18.5%	19.5%	19.5%
Taxes	$ (575.00)	$ 119.00	$ 126.00	$ 31.00	$ 283.00	$ 211.50	$ 185.21	$ 212.64	$ 236.01	$ 248.28
Tax rate	-245.7%	15.5%	12.6%	5.0%	16.4%	15.0%	15.0%	15.0%	15.0%	15.0%
Net Income	$ 809.00	$ 647.00	$ 877.00	$ 592.00	$ 1,446.00	$ 1,198.49	$ 1,049.52	$ 1,204.95	$ 1,337.39	$ 1,406.94
D&A	$ 883.00	$ 888.00	$ 875.00	$ 892.00	$ 888.00	$ 1,031.70	$ 1,089.47	$ 1,149.39	$ 1,210.31	$ 1,273.25
% margin	21.4%	20.0%	19.1%	21.6%	13.6%	15.0%	15.0%	15.0%	15.0%	15.0%
CapEx	$ (473.00)	$ (422.00)	$ (404.00)	$ (309.00)	$ (514.00)	$ (687.80)	$ (726.31)	$ (727.95)	$ (766.53)	$ (721.51)
% margin	-11.5%	-9.5%	-8.8%	-7.5%	-7.9%	-10.0%	-10.0%	-9.5%	-9.5%	-8.5%
Change in NWC	(1,084)	$ (316.00)	$ (260.00)	$ 152.00	$ 700.00	$ 309.51	$ 326.84	$ 306.50	$ 322.75	$ 424.42
% margin	-26.2%	-7.1%	-5.7%	3.7%	10.7%	4.5%	4.5%	4.0%	4.0%	5.0%
Free Cash Flow	$ 2,303.00	$ 1,429.00	$ 1,608.00	$ 1,023.00	$ 1,120.00	$ 1,232.88	$ 1,085.84	$ 1,319.89	$ 1,458.42	$ 1,534.26
FCF Yield	56%	32%	35%	25%	17%	18%	15%	17%	18%	18%

Terminal Year FCF	$	1,534.26
WACC		8.81%
Terminal Value	$	27,181.03
PGR		3.00%
PV of Cash Flows	$	5,120.49
PV Terminal Value	$	17,817.35
Enterprise Value	$	22,937.84
Cash		$ 1,628
Debt	$	3,465.00
Equity Value	$	21,100.84
Shares outstanding		196
Current share price	$	84.36
Implied Share Price	$	107.66
Margin of Safety		27.62%

In constructing the discounted cash flow analysis, it was important to take into consideration that the current short term growth found through relatively lower energy prices and higher fertilizer prices cannot be sustained in the long term. That trend would likely see its fall between 2024 or 2025, with more conservative estimates putting that timeline in 2023. However, this is the same time period within which the company would expand their clean ammonia production, opening more avenues for revenue generation. The production plants would also cause increased capital expenditures in the future. These factors were taken into consideration during the construction of the DCF valuation.

Sensitivity Analysis

PGR \ WACC	8.61%	8.71%	8.81%	8.91%	9.01%
2.00%	$ 93.56	$ 93.56	$ 93.56	$ 93.56	$ 93.56
2.50%	$ 100.05	$ 100.05	$ 100.05	$ 100.05	$ 100.05
3.00%	$ 107.66	$ 107.66	$ 107.66	$ 107.66	$ 107.66
3.50%	$ 116.69	$ 116.69	$ 116.69	$ 116.69	$ 116.69
4.00%	$ 127.61	$ 127.61	$ 127.61	$ 127.61	$ 127.61

COMPARABLES ANALYSIS

	Market Cap (billions)	P/E	EPS	Dividend Yield	Total Debt (billions)	ROA	ROE
MOS	17.467	5.00	10.25	1.56%	4.35	15.02%	33.58%
NTR	41.695	5.69	14.07	2.44%	13.68	12.36%	31.32%
CF	17.753	5.91	15.3	1.77%	3.25	27.74%	59.59%
Mean	25.63833333	5.53	13.20666667	1.92%	7.093333333	18.37%	41.50%
Median	17.753	5.69	14.07	1.77%	4.35	15.02%	33.58%

While CF works within an industry with plenty of competitors, many of those competitors have a different specialized focus within the industry. Therefore, we chose Mosaic and Nutrien as the two companies to compare CF to. Both companies focus on crop inputs, similar to CF. While Mosaic focuses on potash and phosphate, Nutrien produces a mix of nitrogen, potash, and phosphate along with other crop nutrients, crop protection, and seeds. Even within this focused comparable analysis, the companies do differ from each other as Mosaic focuses on two separate products than CF, and Nutrien supplies a whole range of products without specializing in any one in particular. Overall, CF exhibits a higher EPS, ROA and ROE. The higher ROA in particular is an indication that the high asset utilization CF noted is indeed much better than those of their competitors, as the 27% shown by CF is much higher than the next highest ROA by MOS at 15%. The high ROE is due to the lower amount of shares CF has outstanding compared to its peers. With buybacks planned for the next few years, this value is likely to increase greatly. CF also exhibits a lower debt that its competitors, due to its high cash position.

While CF does have a higher P/E ratio than its competitors, it does trade at very similar levels to them. The higher ratio can be explained by the higher stock price and higher EPS that CF exhibits, but due to the similarity of the ratio, not much more information can be derived.

RISKS

Recession

Volatility

ESG

Recession

There are some fears regarding the demand for fertilizer in 2023. As a potential recession looms, both in America and globally, the demand for fertilizer products may fall due to affordability issues. However, we do not see this as a great risk, nor do we see the potential for demand falling as a strong possibility. The demand for greater crop yields are increasing as are grain exports in particular, so we foresee demand in 2023 increasing, not falling.

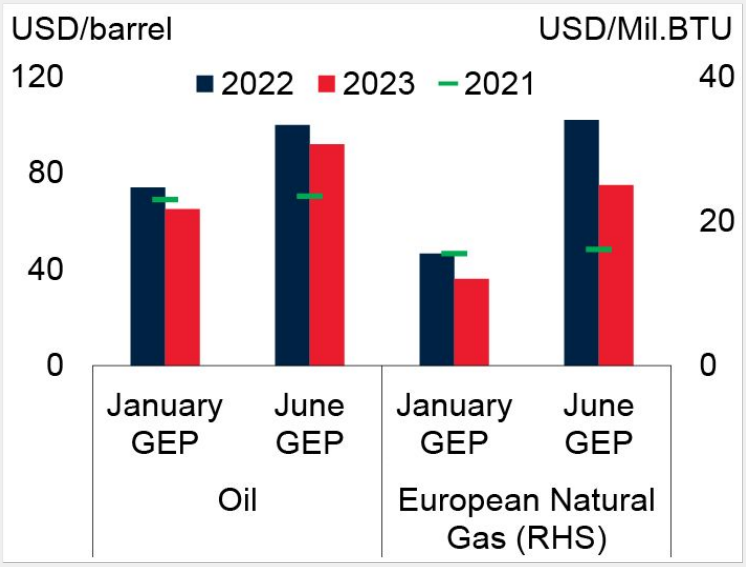
ESG

As mentioned before, CF is an incredibly energy intensive company, with the production of ammonia resulting in high amounts of carbon emissions. With the world looking for more sustainable uses of energy, a company dependent on the release of CO2 does not fit into the net-zero vision. However, CF has already acknowledged the carbon-intensive nature of their princess, and are taking active steps to reign in their carbon footprint.

Volatility

Fertilizer stocks tend to be volatile in their performance. The price of fertilizer mainly depends on the cost of gasoline, and reflects the same volatile market conditions that crops are subject to. Due to the global nature of food supply, supply adjustments are increasingly linked to global factors including global food demand, ocean vessel transportation rates, foreign policies, and exchange rate risk. The longer supply chain also means that fertilizer retailers must project demand and purchase inventories six to nine months prior to the time that producers actually purchase and use the products. As mentioned before, CF's manufacturing facilities have the ability to change their product in a matter of minutes, which does allow them to change their supply quickly if needed. CF has also been taking steps to integrate ERP tools by partnering with SAP, using data to determine the optimal supply chain route. While there is no way to perfectly determine the supply mix and route, these actions help mitigate the effects of volatile market conditions.

Price volatility for fertilizers does tend to affect nitrogen based fertilizers the most. Nitrogen prices, which are more closely linked to energy markets, are more volatile than phosphate and potash prices. Energy prices saw an incredible spike in 2022, and the effects are expected to remain until 2023, and potentially further. Over the long run, global energy prices are likely to continue to be the dominating factor influencing fertilizer prices. While CF has closed many of its European manufacturing plants, which would be hit the greatest by rising energy prices, they would be unable to escape global rising prices.



APPENDIX

TEAM

Tony Will
President and CEO
Joined 2007

Has been in various positions at CF including vice president in corporate development. He has previous experience in global management consulting, technology services, and outsourcing.

Doug Barnard
Senior Vice President, General Counsel
Joined 2004

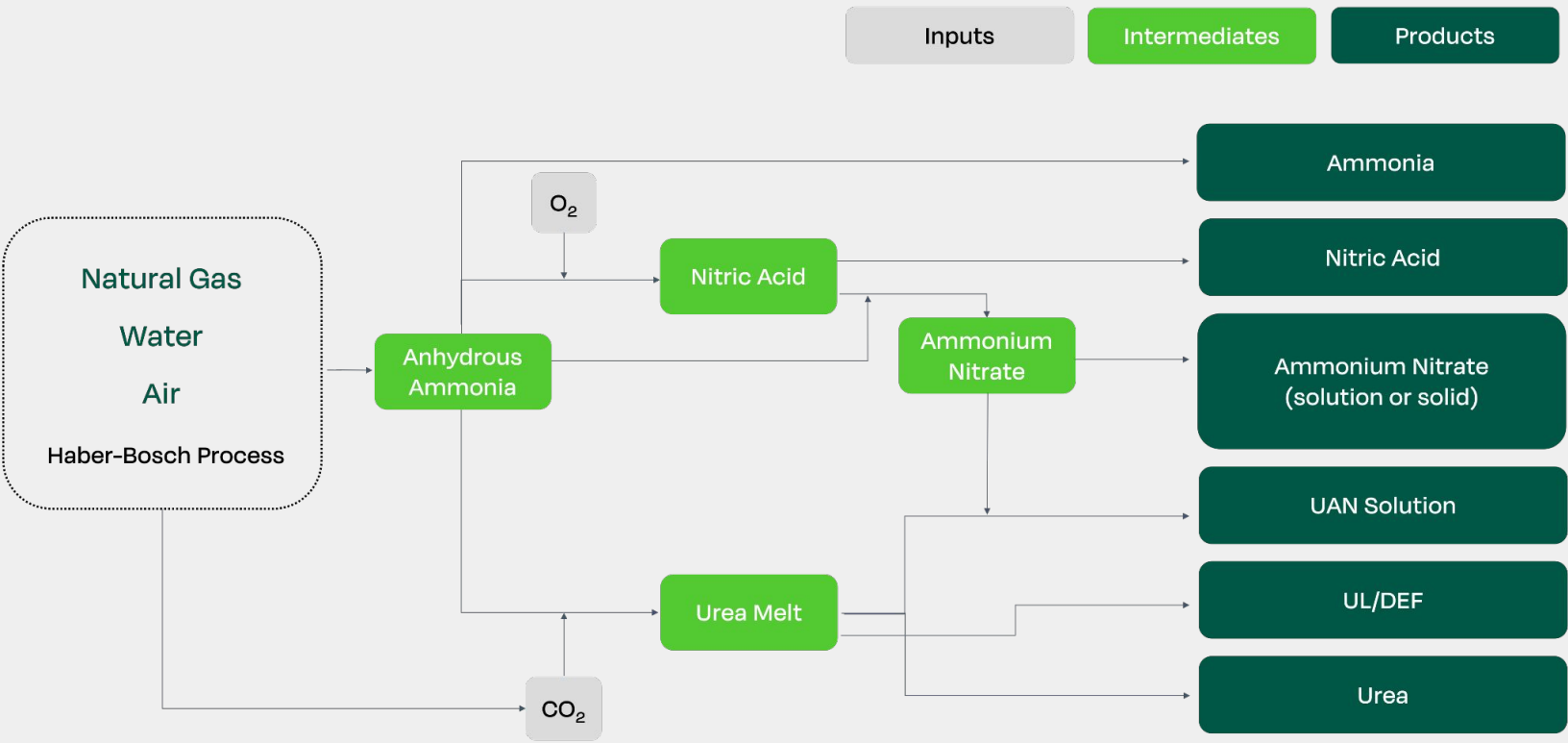
Has worked in various companies as vice president. Holding a J.D., he has previous experience as a general counsel and has been a law partner.

Chris Bohn
Senior Vice President, CFO
Joined 2009

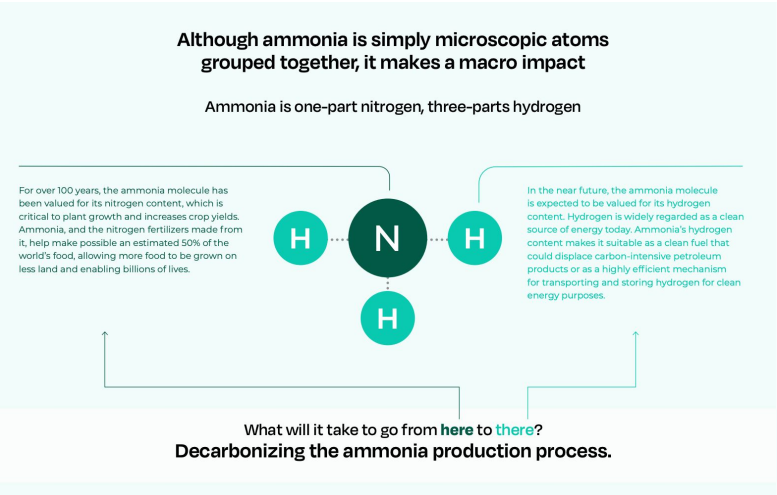
Has previous experience as a vice president and CFO. He has experience in corporate planning and supply chain management.

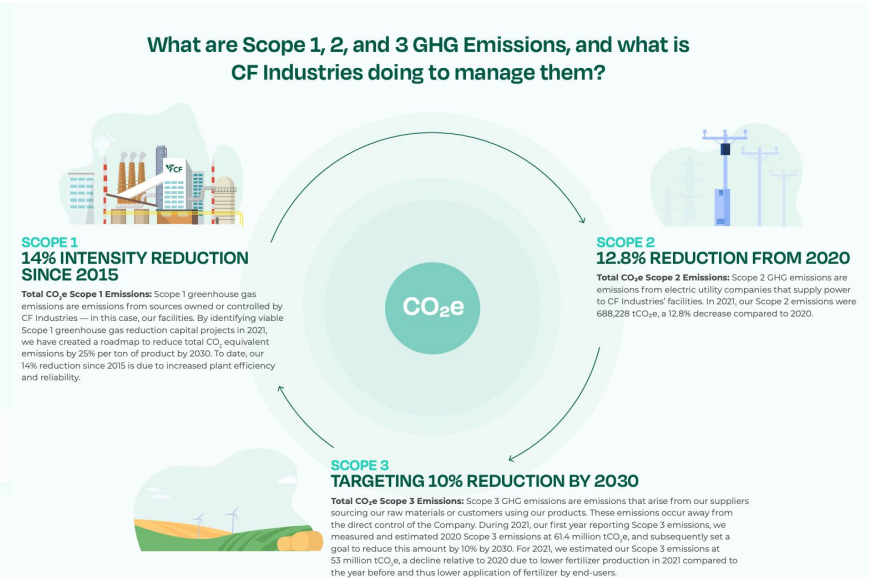
The team consists of experienced individuals who have served CF Industries for over a decade and have extensive knowledge of their respective fields.

CURRENT PRODUCTION PROCESS FOR NITROGEN FERTILIZERS

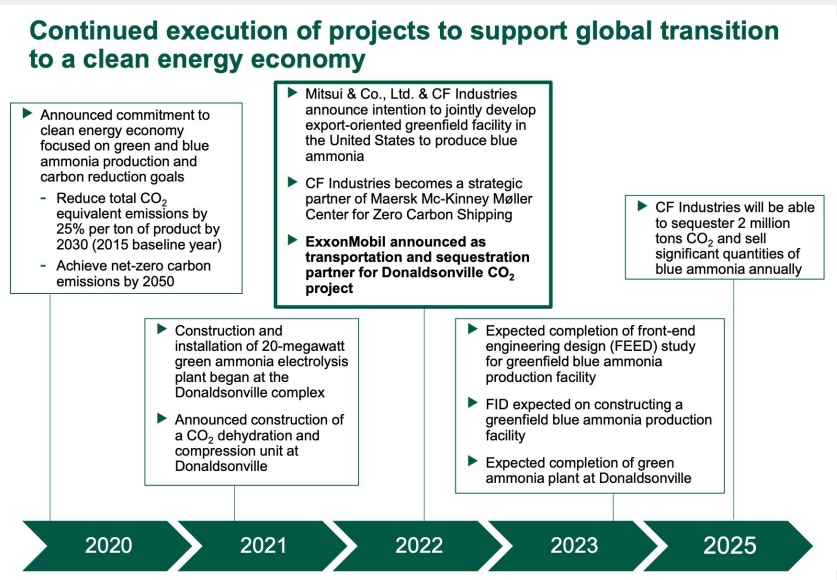


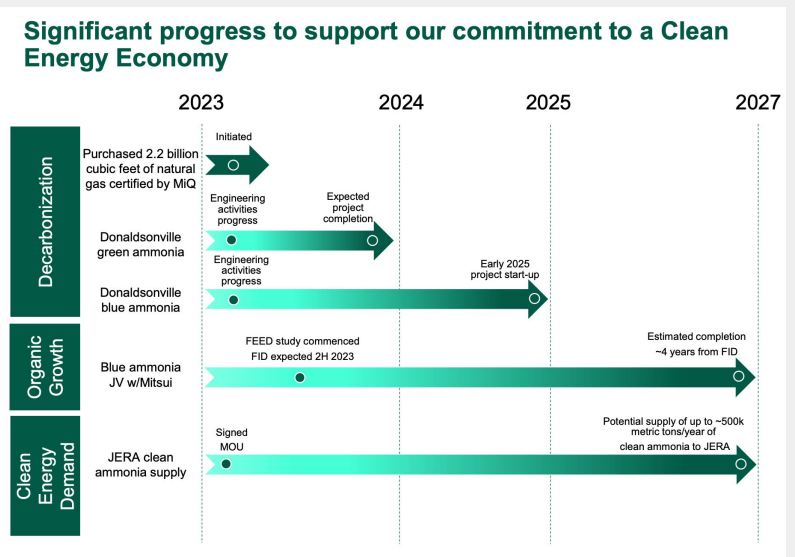
DECARBONIZATION GOALS





DECARBONIZATION TIMELINE





CF is committed to their decarbonization targets, which can be clearly seen by the awareness spread and the timeline they have constructed to ensure accountability to their clean ammonia and decarbonization plans.

REVENUE BREAKDOWN

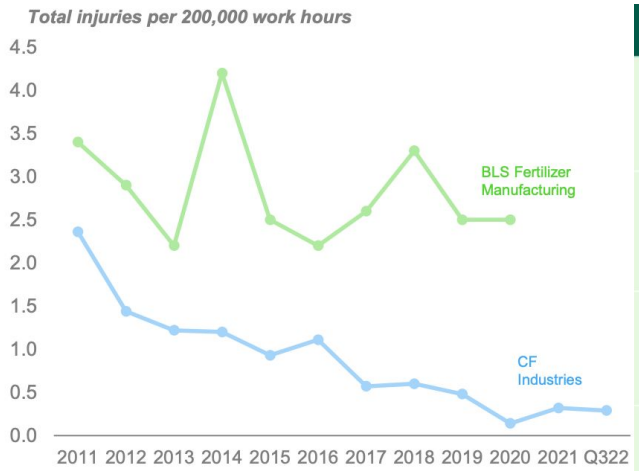
	2021		2020		2019	
	Sales Volume (tons)	Net Sales	Sales Volume (tons)	Net Sales	Sales Volume (tons)	Net Sales
			(tons in thousands; dollars in millions)			
Products						
Ammonia	3,589	$1,787	3,767	$1,020	3,516	$1,113
Granular Urea	4,290	1,880	5,148	1,248	4,849	1,342
UAN	6,584	1,788	6,843	1,063	6,807	1,270
AN	1,720	510	2,216	455	2,109	506
Other (1)	2,318	573	2,322	338	2,257	359
Total	18,501	$6,538	20,296	$4,124	19,538	$4,590

(1) Other segment products include DEF, urea liquor, nitric acid, aqua ammonia, and NPKs.

While demand itself decreased from 2020 to 2021, due largely to affordability concerns, high fertilizer prices allowed for greater net sales. Fertilizer demand is expected to increase over the next few years.

SAFETY

Total Recordable Incident Rate



CF Industries safety performance greatly exceeds industry average

Sustainability Goals	UNSDGs
At least **95%** of the aggregated safety grades of all employees at manufacturing and distribution sites must be a "B" or better for the year	8 DECENT WORK AND ECONOMIC GROWTH
Management of changes in current year closed within **90 days** of pre-startup review	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Safety critical **equipment inspections** completed per schedule	17 PARTNERSHIPS FOR THE GOALS
Receive the "Protect & Sustain" certification (or equivalent environmental/product stewardship certification) for **100% of manufacturing sites** by 2030	

CF is dedicated to ensuring the safety of their employees, shown through their high scores on various safety performance measures.