

SPECIAL REPORT

# Global Fertilizer Industry: Emerging Stronger Post-Plunge

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# Executive Summary

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**01**

## **Nitrogen, phosphorus and potassium are the major primary crop nutrients**

- Nitrogen is the most important primary crop nutrient which helps crops grow in size
- Phosphorus and potassium are the next major primary crop nutrients which help crop quality
- Soil tends to absorb and retain phosphorus and potassium nutrients for a longer period of time
- Urea, Diammonium phosphate (DAP), and Potassium chloride (MOP) are the key fertilizers that provide these nutrients

**02**

## **Asia dominates the production of nitrogen- and phosphate-based fertilizers, while Europe dominates potash-based fertilizers**

- Asia, led by China has dominated the world production of nitrogen- and phosphate-based fertilizers
- Europe, led by Russia and Belarus has dominated the global production of potash-based fertilizers
- The sanctions imposed on Russia and Belarus due to Russia-Ukraine conflict specifically impacted potash fertilizers market

**03**

## **Cultivation of wheat, corn, and rice consumes over half of global fertilizer supply**

- Wheat, corn, and rice represent the staple food in several parts of the world and hence their cultivation involves consumption of more than half of the global fertilizer supply
- Corn demand in the US has significantly increased over the last decade due to its usage in bioethanol production

**04**

## **CF Industries (CF US Equity) appears to be the most undervalued stock**

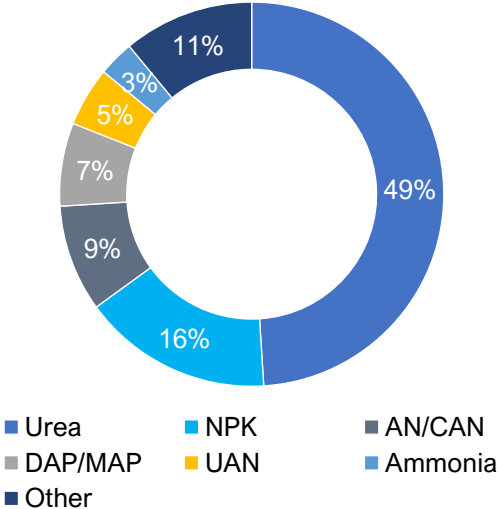
- CF Industries currently trades at FY23E P/E of 9.1x at a significant discount to sector average of 16.3x; the company trades at FY23E EV/EBITDA of 5.9x at a discount to sector average of 6.8x
- The 12-months target price is USD 88.43 based on forward multiples, which provides an upside potential of 15.5% (as of December 8, 2023)

# Global consumption of fertilizer

## Nitrogen fertilizers dominate the global consumption

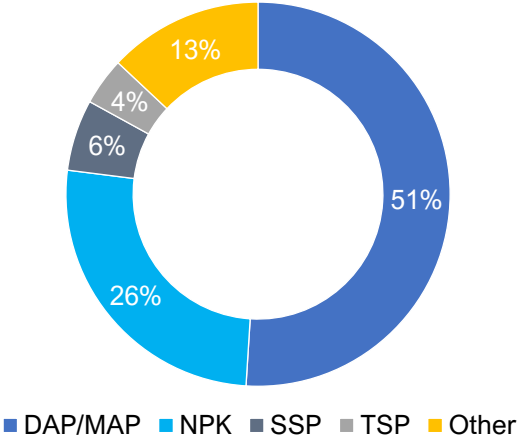
### Nitrogen fertilizers consumption

Global consumption 2022: 111 million tonnes



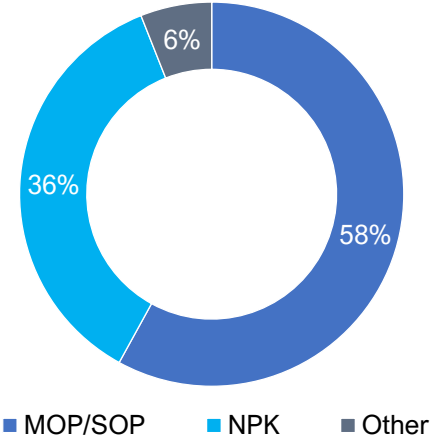
### Phosphate fertilizers consumption

Global consumption 2022: 47 million tonnes



### Potash fertilizers consumption

Global consumption 2022: 35 million tonnes



- Urea, DAP, and MOP are widely used fertilizers worldwide and command the highest market share
- The highest consumption of nitrogen fertilizers has been observed in China and India, where it is used for the cultivation of rice and wheat; the US and Europe consume nitrogen fertilizers for corn and wheat production
- Brazil consumes significant amount of phosphate and potash fertilizers for soybean production

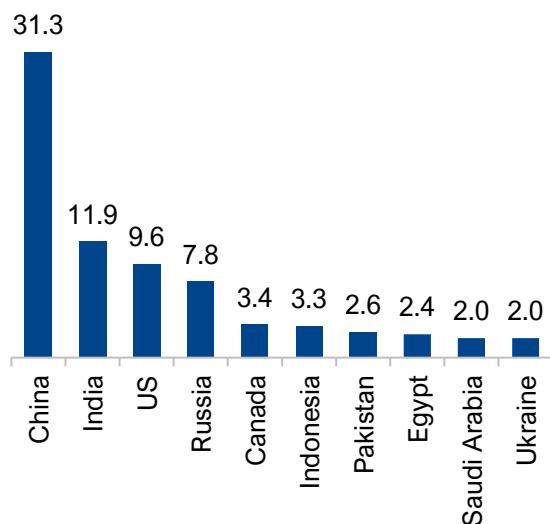
Source: International Fertilizer Association (IFA), Yara, PhosAgro; Data in doughnut charts based on 2020 consumption

# Global production of fertilizers

## Asia dominates the production of nitrogen and phosphate-based fertilizers

### Top Nitrogen producers

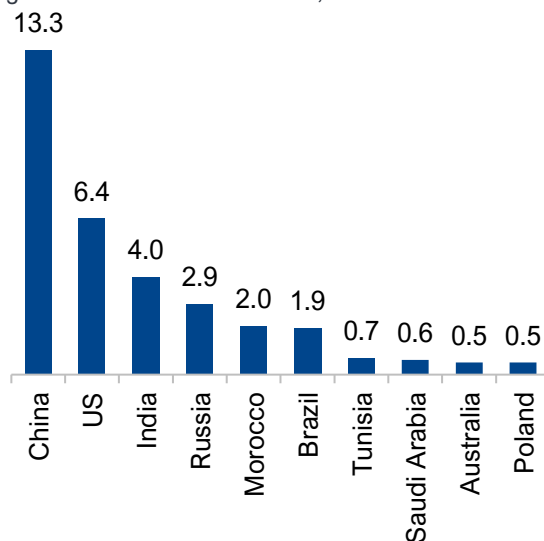
Figures in million metric tonnes, data as of 2020



- Historically, Asia dominated the production of nitrogen-based fertilizers
- IFA forecasts the global nitrogen capability to increase from 156.9 Mt N in 2022 to 170.7 Mt N in 2027, driven by growth in Russia

### Top Phosphate producers

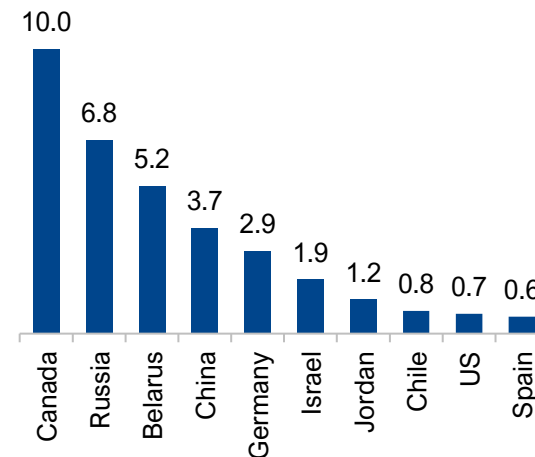
Figures in million metric tonnes, data as of 2020



- China has dominated global phosphate production with ~40-45% of global trade
- IFA anticipates the global phosphate capability to increase from 51.3 Mt P<sub>2</sub>O<sub>5</sub> in 2022 to 57.7 Mt P<sub>2</sub>O<sub>5</sub> in 2027, driven by capacity expansion of existing producers in China, Africa, and West Asia

### Top Potash producers

Figures in million metric tonnes, data as of 2020



- Potash market in 2022 was significantly impacted from the sanctions imposed on Russia and Belarus against exports of potassium chloride
- IFA expects the global potash capability to rise from 46.7 Mt K<sub>2</sub>O in 2022 to 54.6 Mt K<sub>2</sub>O in 2027, driven by ability of Belarus to gain alternative routes to market

Source: International Fertilizer Association (IFA)

# Long-term drivers of global fertilizer consumption

Government support exists in many countries including major consumers like India



Population growth



Economic growth



Government support/regulations



Climate change



Diet changes



Nutrient use across farming

- Population and economic growth are the primary long-term drivers of food demand and in turn of fertilizer consumption
- Diet changes have been playing a major role in changes to the global food supply chain with more and more people adopting healthier diet options
- Climate change has impacted global food industry and farmers worldwide have adjusted the nutrient usage based on the evolving local climatic conditions

**Source:** International Fertilizer Association (IFA)

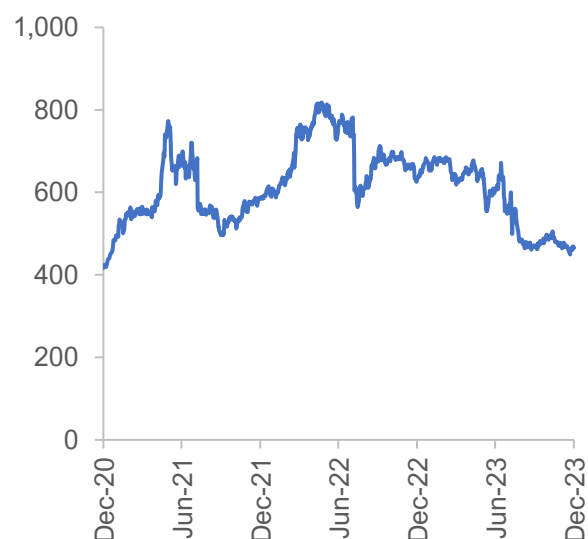
# Prices of major food crops are a key driver of farmers' affordability

## Wheat and corn prices sharply rose in 2022 due to Russia–Ukraine conflict

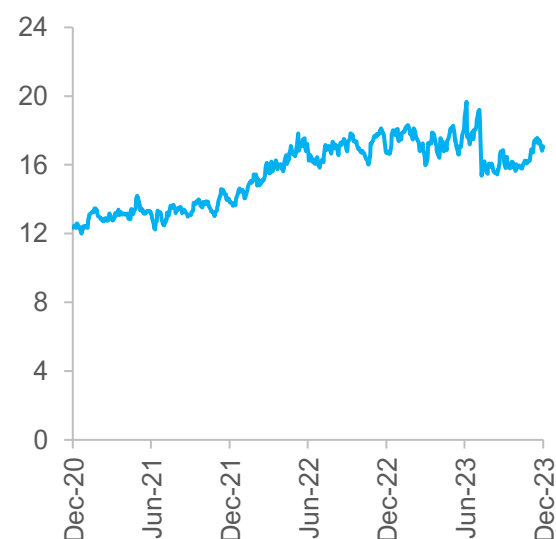
### Wheat prices (\$ per bushel)



### Corn prices (\$ per bushel)



### Rice prices (\$ per hundredweight)



- Wheat, corn, and rice consume more than half of all fertilizers globally; wheat and cereals like barley dominate in Europe (including Russia) with rice being largely consumed in Asia
- Demand for corn has gained momentum in the US over the last decade due to usage in bioethanol production
- The prices for wheat and corn remained elevated in 2022 due to the supply chain disruption from the Russia-Ukraine conflict

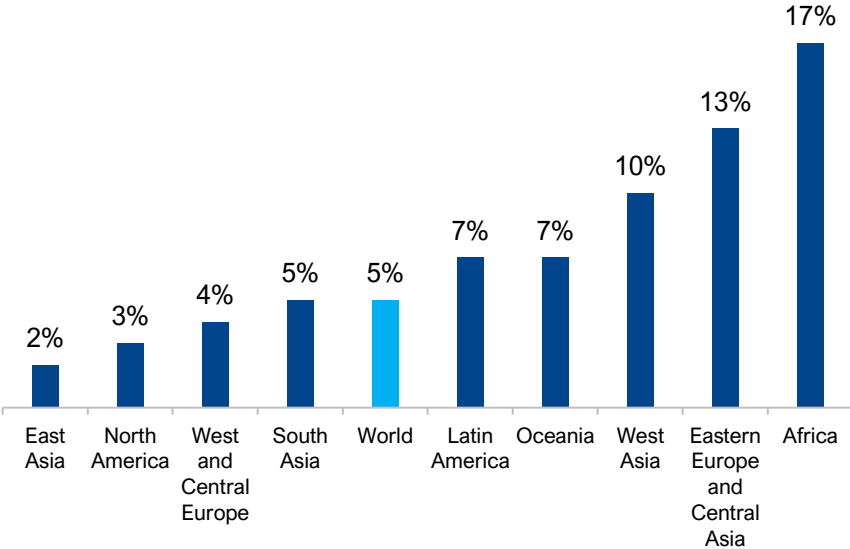
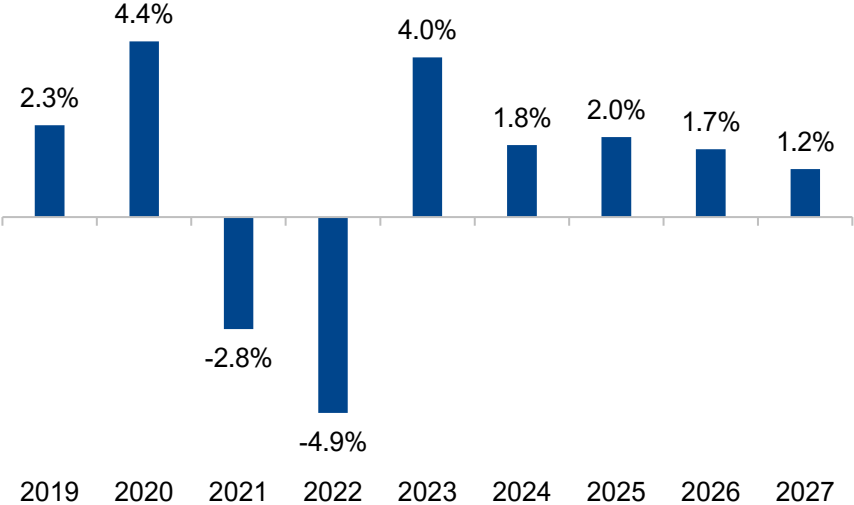
Source: International Fertilizer Association (IFA), Bloomberg

# Global fertilizer consumption largely depends on farmers' affordability

Consumption likely to recover in 2023 after two consecutive years of contraction

Global fertilizer consumption change

Fertilizer consumption growth forecast by region (2024-27)



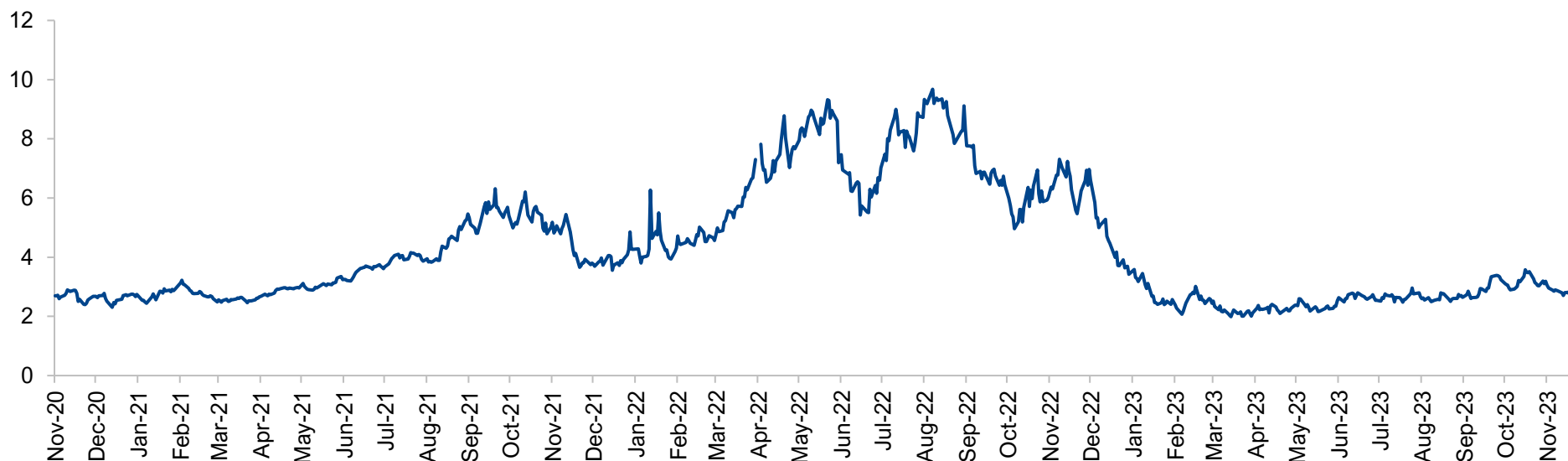
- Fertilizer consumption dropped in 2021 and 2022 due to the high fertilizer prices that negatively affected the farmers' affordability globally
- With fertilizer prices now at more favorable levels, consumption worldwide are expected to increase in the medium term
- IFA expects South Asia and Latin America to contribute 40% of the global fertilizer consumption in 2024 – 27 with resilient growth rates of 5% and 7%, respectively

Source: International Fertilizer Association (IFA)

## Natural gas is the main raw material for fertilizer production

Prices more than doubled in 2022 due to the Russia–Ukraine conflict, but returned to pre-war level

Natural gas price (USD per Metric Million British Thermal Unit; \$/mmbtu)



- Natural gas is the key feedstock and energy source for ammonia, which is the building block of all nitrogen fertilizers
- Natural gas accounts for ~70-90% of the total ammonia production costs
- Natural gas price more than doubled in 2022 and the high natural gas price led to shutdown of 70% of the European fertilizer production. However, they have fallen back to pre-war level.

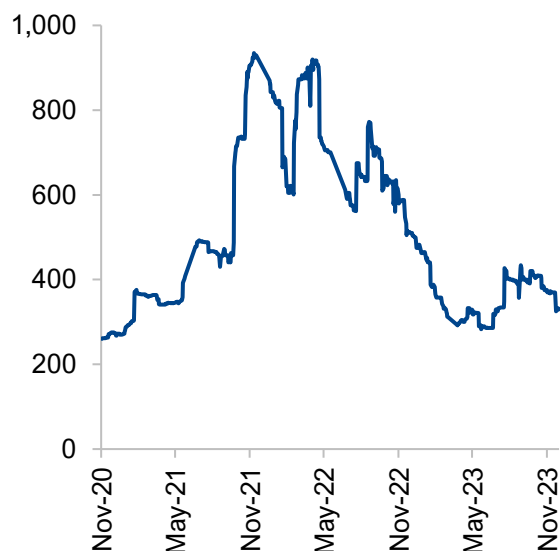
Source: Bloomberg



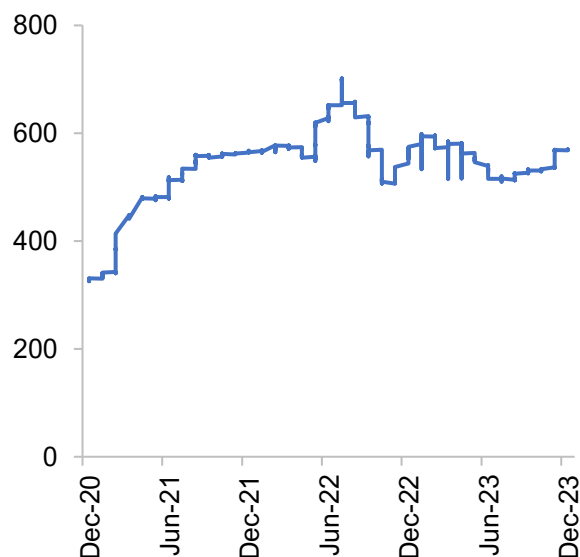
# Global fertilizers' prices

Record high fertilizer prices in Q2 2022 normalize eventually, supporting farmers' affordability

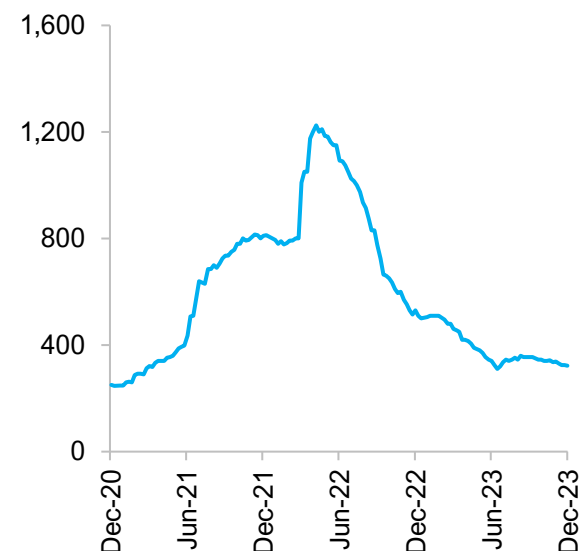
Urea prices (USD per metric ton)



DAP prices (USD per metric ton)



MOP prices (USD per metric ton)



- Global fertilizer prices peaked in Q2 2022 due to the sanctions on major producers (Russia and Belarus), export restrictions from China, and high raw material costs
- However, as the supply situation improved the prices declined from their peak, improving the affordability for farmers worldwide
- The supply situation improved as governments ensured that flow of food and fertilizers are not impacted from sanctions with trade facilitation support from sovereigns and industry
- Moreover, raw material prices decreased as markets adjusted to reduced reliance on Russian supply

Source: International Fertilizer Association (IFA), Bloomberg

# Global fertilizer manufacturers' valuation

CF Industries (NYSE:CF) stands out in terms of P/E and EV/EBITDA valuation

## Key global fertilizer companies

Company	Market Cap (USD million)	P/E						EV/EBITDA					
		2020A	2021A	2022A	2023E	2024E	2025E	2020A	2021A	2022A	2023E	2024E	2025E
Nutrien Ltd.	26,436	NM	9.7x	3.8x	11.3x	10.7x	10.9x	12.6x	6.3x	3.4x	6.7x	6.7x	6.8x
Public Joint-Stock Company PhosAgro	16,292	NA	NA	5.6x	8.9x	9.3x	10.6x	11.4x	5.0x	4.4x	5.8x	6.5x	7.0x
CF Industries Holdings, Inc.	14,195	NM	17.4x	4.5x	9.1x	11.5x	12.5x	11.3x	5.5x	2.5x	5.9x	6.6x	7.5x
The Mosaic Company	11,465	20.0x	8.1x	3.5x	9.3x	10.5x	10.5x	11.9x	4.2x	2.4x	5.5x	5.9x	6.0x
Yara International ASA	8,315	12.7x	18.7x	3.3x	33.0x	10.9x	9.1x	6.2x	4.5x	2.7x	6.9x	5.1x	4.7x
ICL Group Ltd	6,521	NM	8.3x	3.2x	9.5x	10.3x	10.5x	10.9x	5.7x	2.3x	5.2x	5.7x	5.3x
Coromandel International Limited	4,382	23.9x	21.5x	18.1x	18.6x	16.3x	14.9x	14.6x	13.9x	10.9x	12.0x	10.8x	9.9x
OCI N.V.	4,174	-23.4x	7.3x	3.4x	33.2x	10.1x	11.2x	11.0x	3.3x	2.2x	5.8x	4.3x	4.2x
Incitec Pivot Limited	3,613	34.2x	5.6x	19.9x	13.6x	13.6x	13.0x	8.0x	6.1x	9.0x	7.5x	7.6x	7.6x

<b>Average</b>	<b>13.5x</b>	<b>12.1x</b>	<b>7.3x</b>	<b>16.3x</b>	<b>11.5x</b>	<b>11.5x</b>	<b>10.9x</b>	<b>6.0x</b>	<b>4.4x</b>	<b>6.8x</b>	<b>6.6x</b>	<b>6.6x</b>
<b>High</b>	<b>34.2x</b>	<b>21.5x</b>	<b>19.9x</b>	<b>33.2x</b>	<b>16.3x</b>	<b>14.9x</b>	<b>14.6x</b>	<b>13.9x</b>	<b>10.9x</b>	<b>12.0x</b>	<b>10.8x</b>	<b>9.9x</b>
<b>Low</b>	<b>-23.4x</b>	<b>5.6x</b>	<b>3.2x</b>	<b>8.9x</b>	<b>9.3x</b>	<b>9.1x</b>	<b>6.2x</b>	<b>3.3x</b>	<b>2.2x</b>	<b>5.2x</b>	<b>4.3x</b>	<b>4.2x</b>
<b>Median</b>	<b>20.0x</b>	<b>9.0x</b>	<b>3.8x</b>	<b>11.3x</b>	<b>10.7x</b>	<b>10.9x</b>	<b>11.3x</b>	<b>5.5x</b>	<b>2.7x</b>	<b>5.9x</b>	<b>6.5x</b>	<b>6.8x</b>

- Russia-based PhosAgro trades at FY23E P/E of 8.9x, which is at the highest discount to the sector average of 16.3x. US-based CF Industries also trades at 9.1x, which is at a significant discount to the sector average.
- Israel's ICL Group trades at FY23E EV/EBITDA of 5.2x, which is at the highest discount to sector average of 6.8x. US-based Mosaic trades at 5.5x, which is also at significant discount to the sector average.
- CF Industries appears to be the most attractive based on P/E and EV/EBITDA valuation, with the upside potential of 15.5% (as of December 8, 2023) based on forward multiples.

Source: Capital IQ; Data as of December 8, 2023



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