GLOBAL IRON ORE PELLETS INDUSTRY

Outlook - 2030

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sd@televisoryglobal.com

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Iron Ore Pellets

Pellets are small and hard iron balls of diameter 10-20 mm and are the raw material for iron/steel making. The pelletizing process was commercially introduced to the world market in 1955, following the World War II scarcity of high-grade natural iron ore in the United States. Hence, the need to utilize low-grade ore was paramount and commenced the process of sintering and pelletization. The pelletization of iron ore is a process designed to transform fines into agglomerates to feed blast furnace and DRI producing units. Widespread adoption of pellets started in US, Europe and increased in China and other Asian countries at the start of the 21st century. Pellets are a better feed for iron making as compared to other feeds due to its uniform size, high metallization rate, increased permeability in the blast furnace to optimize fuel consumption rate.

Types of Pellets: There are two types of pellets; acid or basic pellets made from various ore types. Acid pellets are also called as DRI grade pellets while basic pellets are also known as BF grade or fluxed pellets.

Blast Furnace (BF) Pellets

Basicity of these pellets is greater than 0.1 and can vary up to a level greater than 0.6. These pellets contain a higher level of calcium oxide (CaO). During firing of these pellets, the availability of CaO considerably favours the crystal growth of hematite. These pellets normally have a high mechanical strength after pellet firing. Fluxed pellets exhibit good strength, improved reducibility, swelling and melting characteristics. Because of such properties, these pellets give better performance in the blast furnace.

Direct Reduced Iron (DR) Pellets

Basicity of DR pellets is usually less than 0.1. These pellets normally have a large volume of open pores. The reduction gas quickly penetrates through these pores into the pellet core and simultaneously attacks the structure in many places. This results in an early structural change which begins at low temperatures over the entire pellet volume. Unlike the blast furnace, DR pellets processes do not involve a slag phase. Hence gangue minerals present in the pellets will remain in the DRI products, and not be transferred to a slag phase. Therefore, a high total iron content and a low gangue content are of utmost importance for DR pellets.

Global Iron Ore Pellets Demand

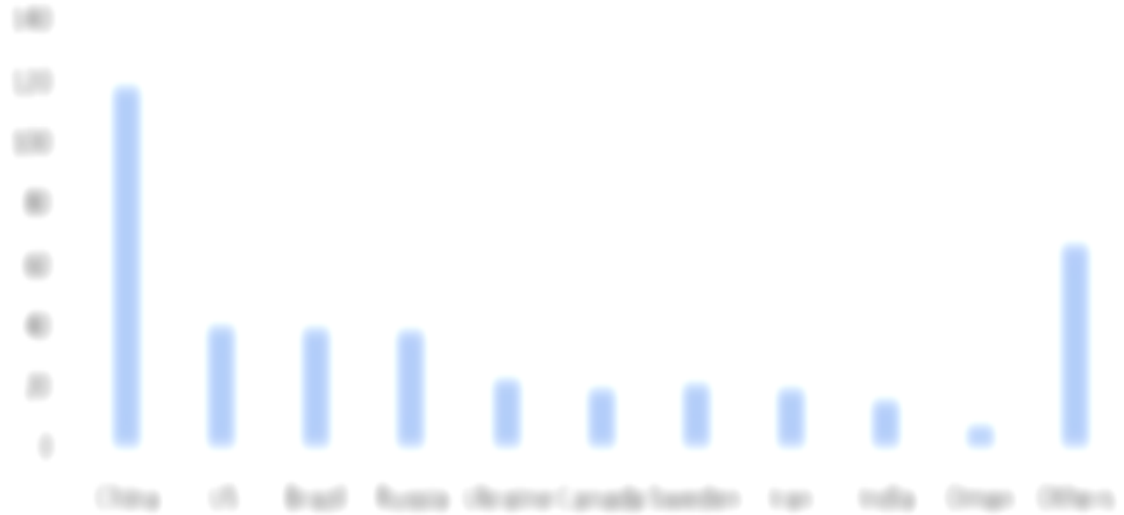
Global demand for pellets has been increasing steadily at a CAGR of XX.X% over the past ten years ending 2017.

Chart X: Global Pellet Demand (Million Tonnes)

Global Pellet Production

China is the largest producer and consumer of pellets globally with the total production of XXXX Mt in 2017. The United States is the second biggest producer with largely captive consumption. Brazil, Ukraine, and Sweden are the major merchant pellet producer with combined production of XXX Mt in 2017 which supplies to the seaborne pellets trade.

Chart X: Global Pellet Production 2017 (Million Tonnes)



Iron Ore Pellets Industry Structure

The seaborne iron pellet market is highly concentrated among few players due to their large capacity and manufacturing cost advantage.

Chart X: Seaborne Major Players Pellet Capacity

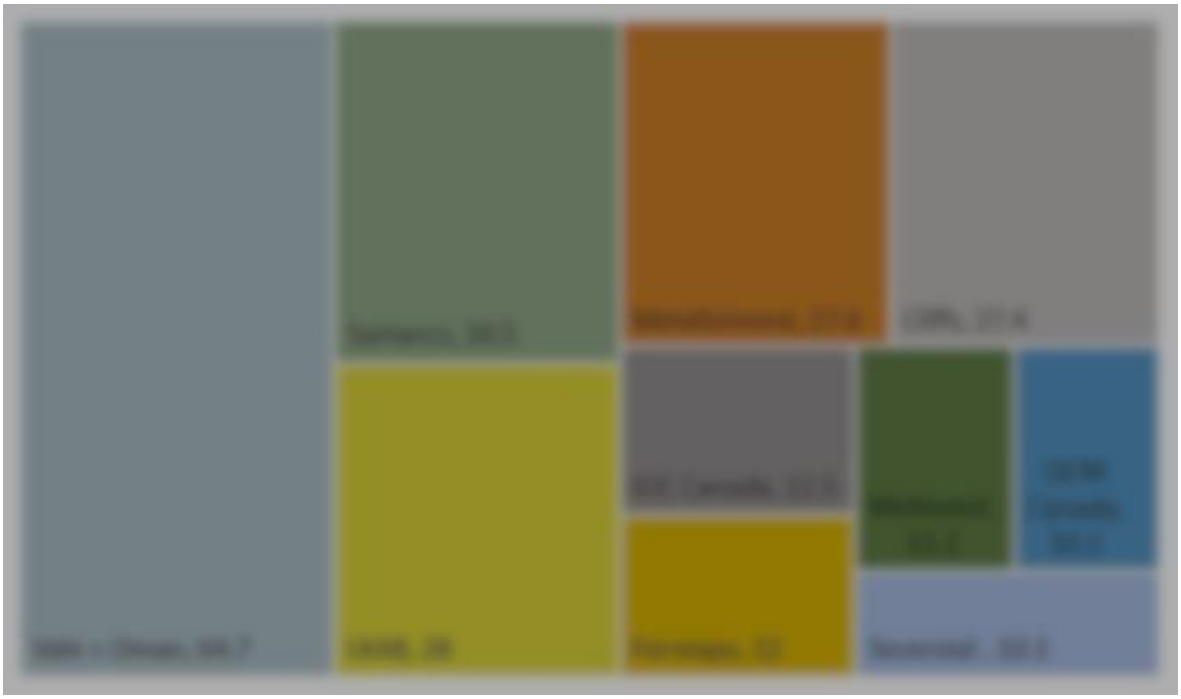


Chart X: Segment EBITDA Margins of Pellet Players

Iron Ore Pellet Industry Outlook - 2030

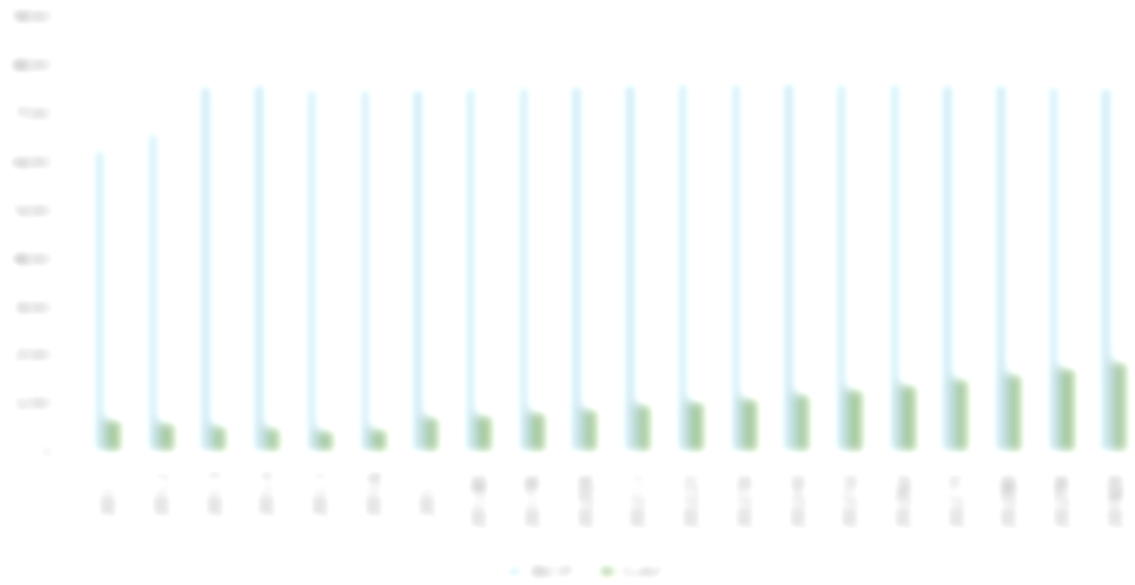
Global Steel Outlook

Chart X: World Crude Steel Production (Million Tonnes) and EAF Share

Source: Televisory Research

China Steel Outlook

Chart X: China Crude Steel Production (Million Tonnes)



Source: Televisory Research

Chart X: Global Pellet Demand Outlook (Million Tonnes)

Source: Televisory Research

Iron Ore Pellets Price/Premium Outlook

Iron ore pellets premium is dependent on the price of iron ore fines, which is highly volatile and depends upon the global demand-supply dynamics. Pellet premium is also positively correlated with the coking coal prices, which plays a significant role in the BF feed mix.

Chart X: Coking Coal Prices vs Pellet Premium (USD/Tonne)

Source: Televisory Research