



MAGNETITE

THE FUTURE OF IRON ORE

FACTORS THAT DETERMINE THE VALUE OF AN ORE DEPOSIT:

GRADE
THE % OF THE ORE THAT IS IRON

TYPE
OF IRON OXIDE PRESENT

Fe₃O₄ MAGNETITE



DEPOSITS
GENERALLY
HAVE IRON
GRADES
BETWEEN
20-30%

THESE ORES ARE PROCESSED INTO AN IRON ORE CONCENTRATE OF APPROXIMATELY 65% IRON, WHICH ARE ONLY THEN USABLE BY STEEL PRODUCERS.

HEMATITE Fe₂O₃
CAN OCCUR AT VARIOUS GRADES



APPROX. 30% IRON



55% - 65% IRON

KNOWN AS DIRECT SHIPPING ORE (DSO), THIS ORE CAN BE SHIPPED DIRECTLY TO STEEL PRODUCERS WITH VIRTUALLY NO PROCESSING.

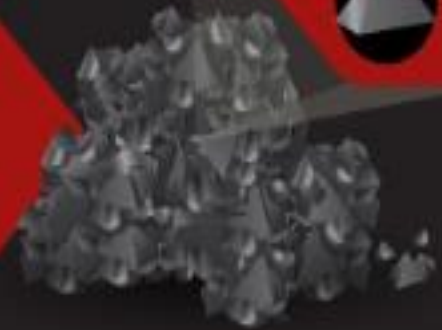
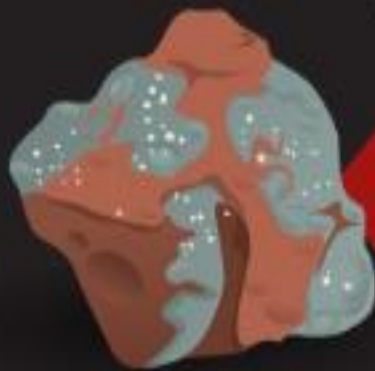
DSO IS THEREFORE CHEAPER, BUT HEMATITE SUPPLY IS RUNNING LOW. MINING OPERATIONS WORLD WIDE ARE SHIFTING TO THE MORE AVAILABLE MAGNETITE DEPOSITS.

WITH RAPIDLY GROWING DEMAND, AN IMPORTANT PARADIGM SHIFT IS OCCURRING IN THE IRON SECTOR:



Magnetite Ore, long the leading source of domestic iron supply in North America, Europe and China, is now increasingly relevant across the globe. The perception that Magnetite Ore is an inferior substitute to Hematite Ore is now firmly changing.

These two main types of iron ores have important differences:



Magnetite is magnetic and hematite is not. This is mainly because of different crystal structures,



Hematite gets its name from its blood red colour, as it resembles hemoglobin.



56%
TO
64%

Hematite ores often have high levels of iron content of between 56% and 64%. At this grade, these ores are known as **Direct Shipping Ores**

[DSO]

DSO can be shipped immediately to blast furnaces for iron and steel production with little costly processing.



Magnetite is the most magnetic mineral found in the natural world.



Magnetite ore typically has much lower iron content than hematite ore (25% to 40%)



Therefore it must be 'concentrated' before it can be used in iron and steel production.



Concentration takes advantage of the magnetic properties. Powerful electromagnets help separate magnetite from the waste rock.



Honey bees, homing pigeons, and dolphins all contain magnetite in their brains. These internal compasses allow them to navigate over long distances.

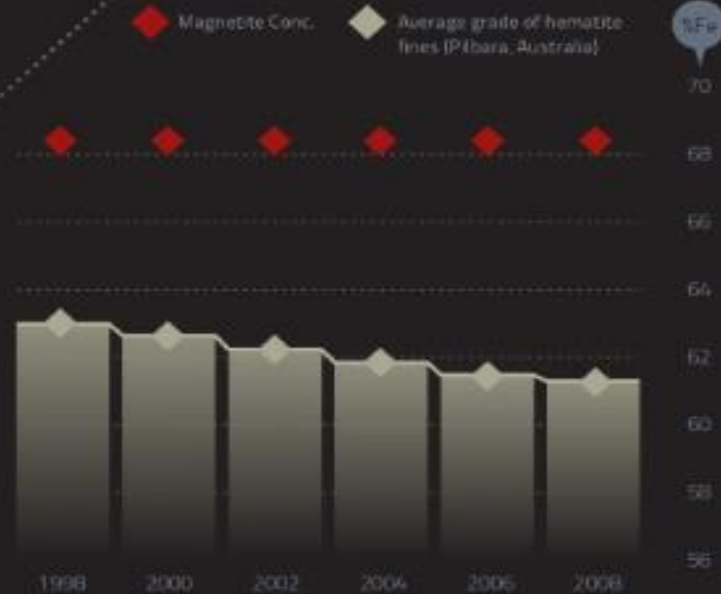
Recently, we have begun to exhaust high grade, easily accessible DSO deposits.



In response, explorers have begun targeting other types of iron ore, namely Magnetite.



DSO's iron content can vary, but the iron content of magnetite is consistently high with low impurities.



Magnetite Concentrate is a premium product consistently > 68% Fe

As a result, magnetite concentrate is suitable for the production of premium quality iron and steel.

TWO MAJOR ADVANTAGES

01

Consistently High Iron Content

02

Less Carbon Emissions

Magnetite concentrate's purity and high iron content translates to lower carbon emissions during iron production than DSO ore.

A life cycle analysis by the Crucible Group produced the following numbers:

(per tonne of magnetite concentrate)

64 kg

It takes 64kg of CO2 to concentrate the magnetite...

but it generates

172 kg

less emissions than DSO, which is put directly into a blast furnace.

for a net reduction of 108kg

108 kg

Conclusion

Despite the additional costs involved in concentrating magnetite ore, magnetite concentrates do have significant advantages over DSO ores.



As easily accessible, economic hematite deposits become rarer, magnetite ore will continue to emerge as an important source of the world's iron.

VISUAL CAPITALIST IS COMMITTED TO PROVIDING INDEPENDENTLY RESEARCHED CONTENT FOR EDUCATIONAL PURPOSES.

THANKS TO IRON ROAD LIMITED FOR COVERING THE PRODUCTION COSTS OF THIS PROJECT.
LEARN MORE AT WWW.IRONROADLIMITED.COM.AU



ASX: IRD

VISUAL CAPITALIST: EDUCATING A NEW GENERATION OF INVESTORS ON RESOURCE INVESTING AND MANAGEMENT.



VISUALCAPITALIST

www.visualcapitalist.com
@VisualCap

