



***Gcwihaba Resources***

***Ngamiland Iron Ore Mine***

***The Game Changer the Country is Looking For?***



# Company Profile



**TSODILO RESOURCES LIMITED**

**Newdico (Pty) Ltd**  
Exploration services  
100% owned

**Gcwihaba Resources (Pty) Ltd**  
PLs – Metals  
100% owned

**Bosoto (Pty) Ltd**  
PL – Precious Stones  
(BK16)  
100% owned

➤ Canadian Registered: TSX listed 1995: TSX.V listed 2001

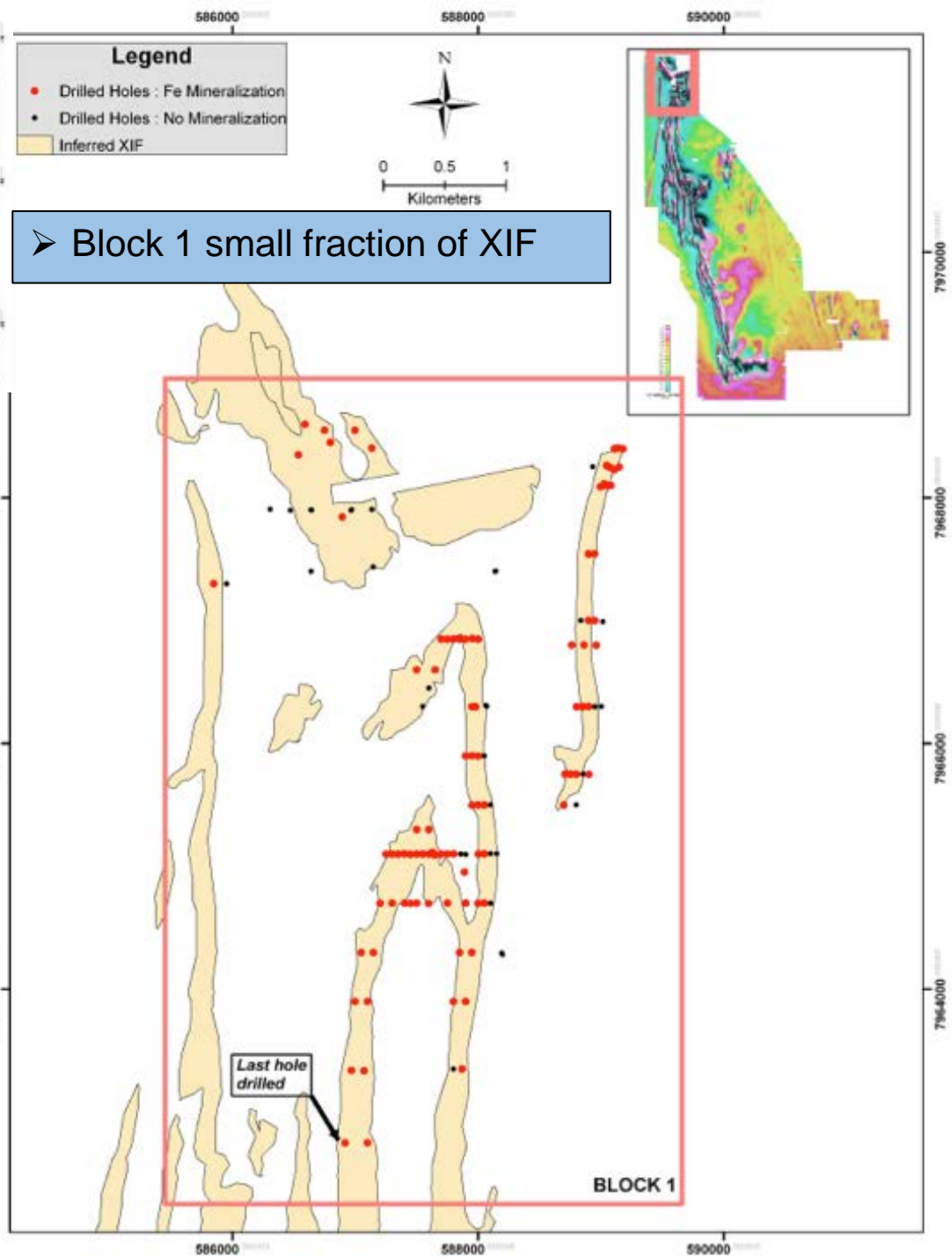
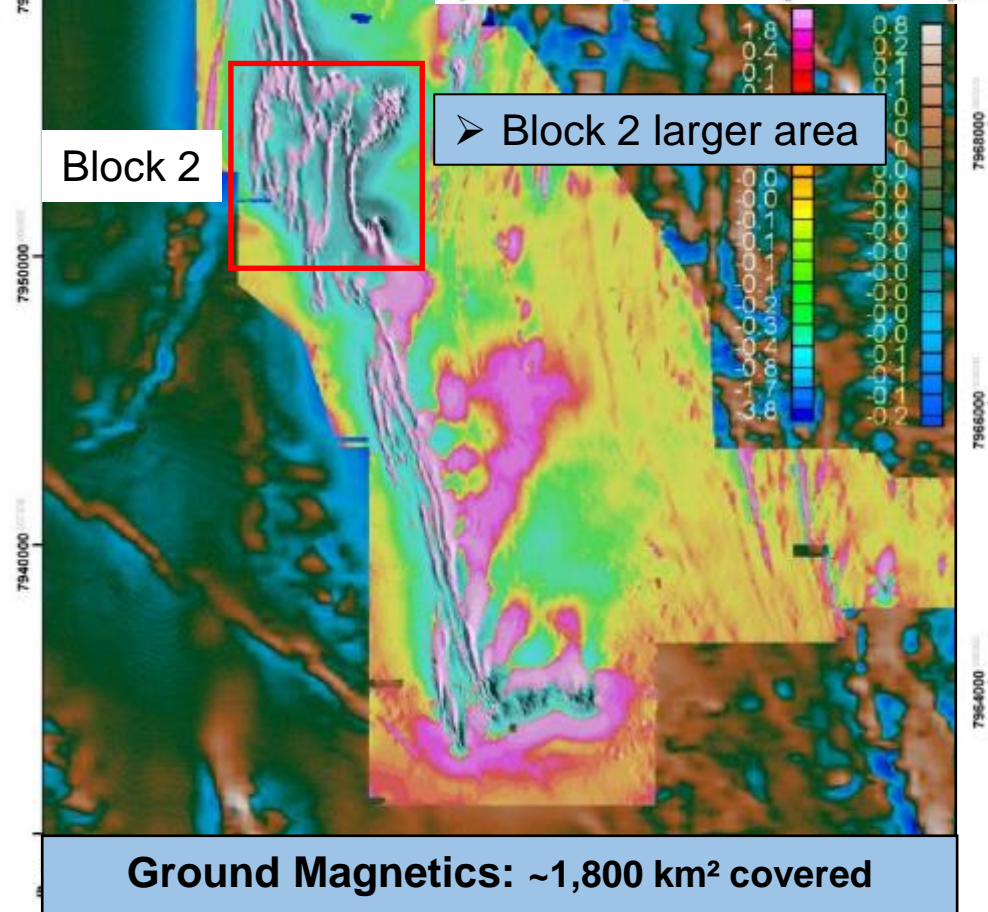
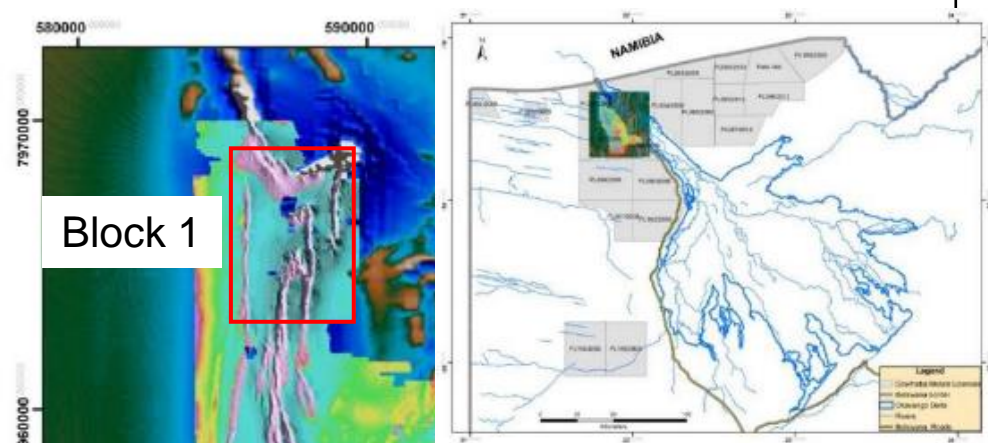
# XIF Project – Northwest Botswana



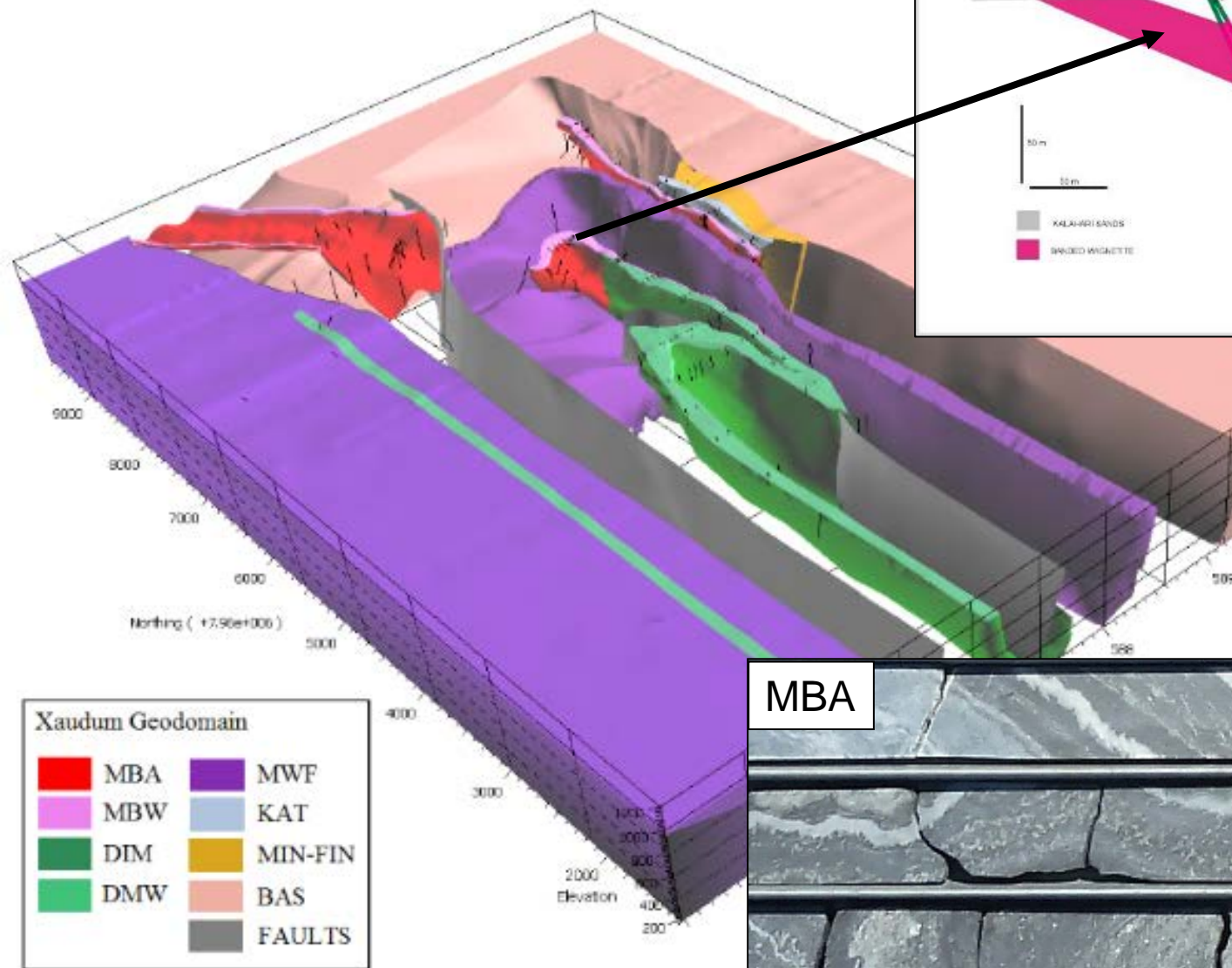
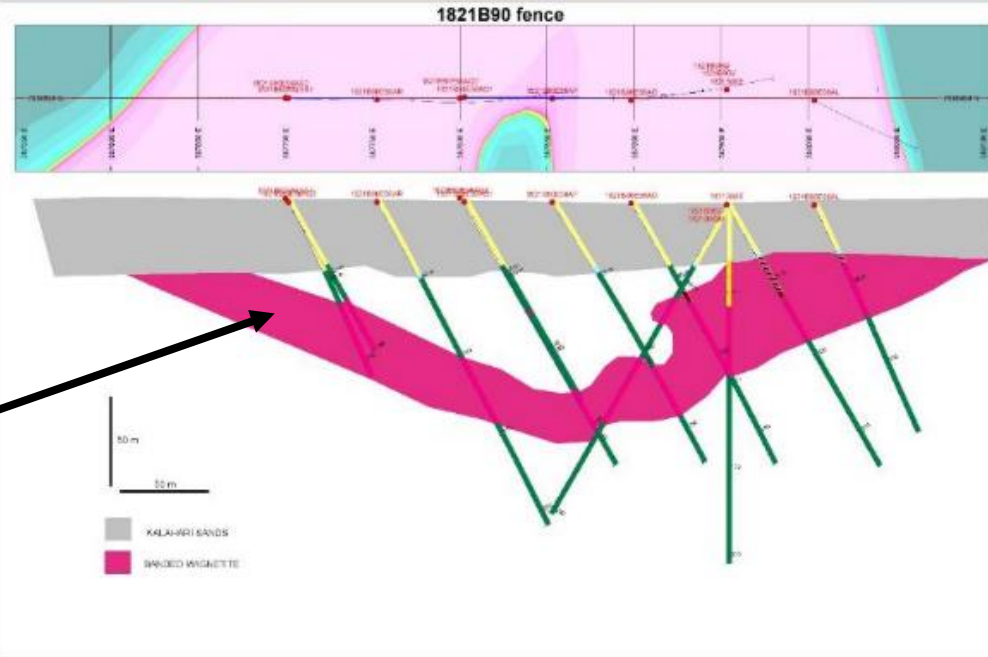
**What you see on top is not the same as underneath.....**



**...so the project is driven by geophysics and drilling.**



# Deposit Modelling



- East – West drilling across main strike of mineralization
- Fold hinges best for large areas of mineralization
- GOCAD 3D modeling software

MBA

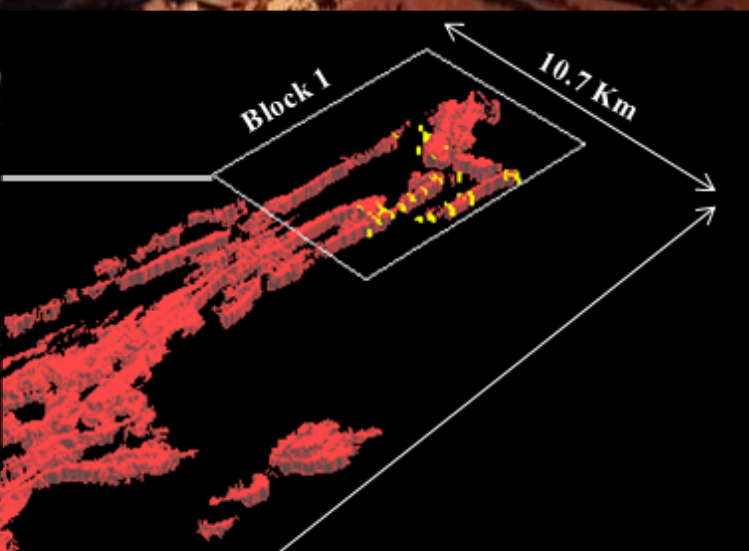
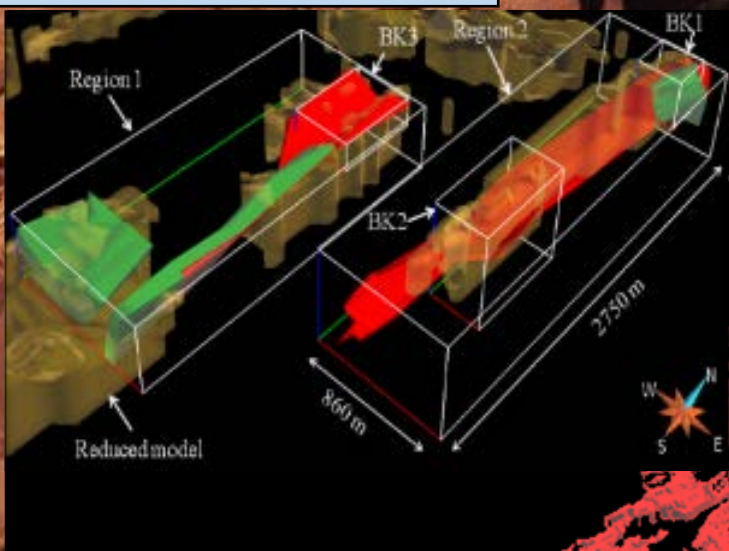


# Resource + Post Beneficiation – “Tip of the Iceberg”

Resource Statement				DTR Magnetic Separation Concentrate Information (P80 = 80 Microns)		
Geodomain	Resource Category	Tonnes (Mt)	Fe % head	Mass Recovery	Concentrate (Mt)	Fe % concentrate
MBA	Inferred	236.0	35.60	45.5	107.4	67.9
DIM	Inferred	148.0	20.90	17.9	26.5	66.4
MBW	Inferred	21.0	34.30	25.4	5.3	66.4
DMW	Inferred	29.0	20.50	21.6	6.3	67.7
MGS	Inferred	7.0	22.10	10.7	0.7	63.2
<b>TOTAL</b>	<b>Inferred</b>	<b>441.0</b>	<b>29.4</b>	<b>33.2</b>	<b>146.2</b>	<b>67.2</b>

**Mass recoveries at P80 grind sizes of 80 microns = Based on the metallurgical magnetic separation test work conducted**

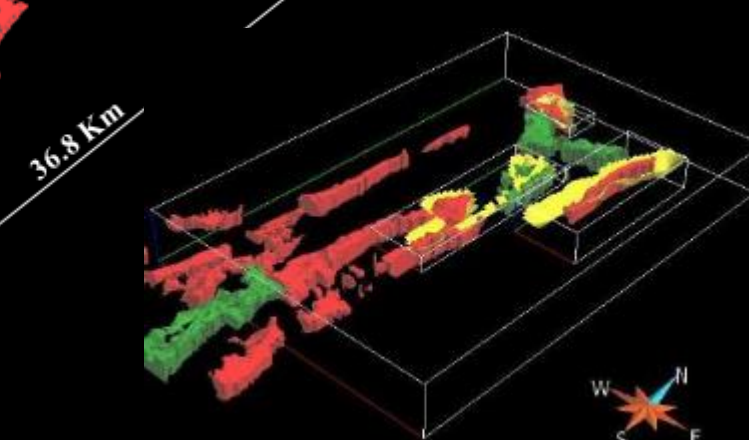
# “The Rest of the Iceberg”



- Conservative exploration target of 5 - 7 Bt
- Grade 15 – 40 % Fe\*



*\*It is important to note that the tonnages and grade quoted in this exploration target is conceptual in nature, there has been insufficient exploration to define a mineral resource and that it is uncertain if further exploration will result in the target being delineated as a mineral resource as defined by NI 43-101.*



Local Block 1	Min	Max	Actual SRK MRE
(All)	(Mt)	(Mt)	441 Mt
TOTAL	273	388	

**Red area = Ground magnetic inversion model**  
**Current drill holes in yellow.**

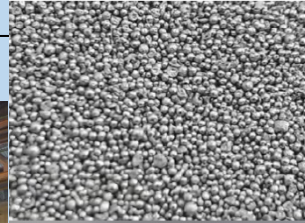


# Potential Production Options

## Option 1: (FeSi)

**Ferrosilicon (FeSi) production and sales for Dense Media Plants (DMS) across Africa**

- **FeSi sales to regional copper, diamond, and coal mines**
- **Small scale start up operation – ~1.8 Mtpa ROM**
- **Could be a 50 year plus life of mine**



## Option 2 : Medium Size

**Medium Size Iron Ore Mine - Magnetite Concentrate sales through Walvis Bay**

- **Magnetite concentrate produced at 67% Fe**
- **Shipped to international markets such as Europe, India, and China**
- **Medium Size Mine – 7.2 Mtpa ROM**
- **Potentially 50 year plus life of mine**



## Realistic Option 3

**Full Size Iron Ore Mine - Magnetite Concentrate international sales through Walvis Bay**

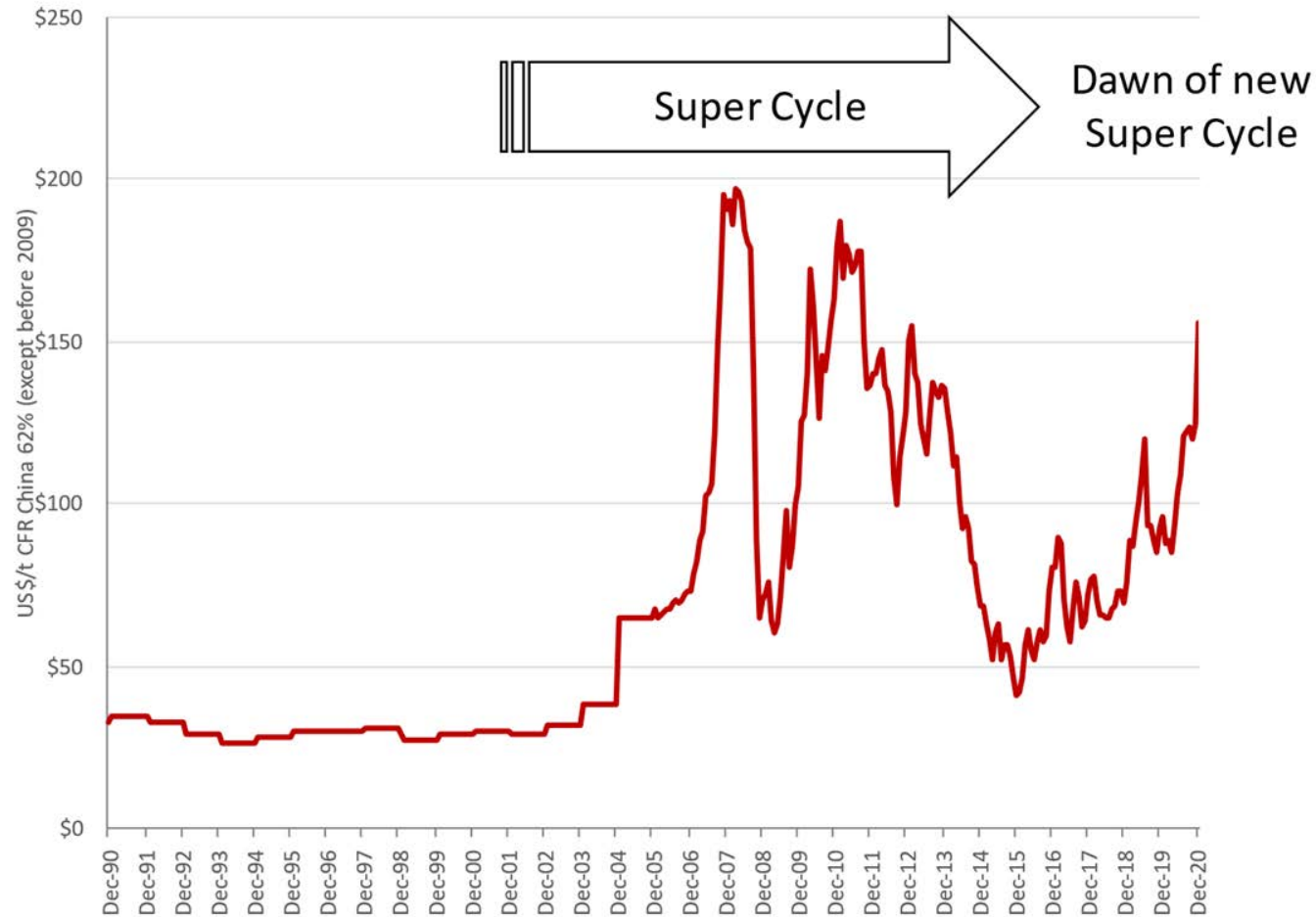
- **Magnetite concentrate produced via magnetic concentrator at 67% Fe**
- **Magnetite concentrate further beneficiated to Pellets via pelletizing plant**
- **Upgraded Rail Line From Mine to Walvis Bay**
- **Upgraded Port at Walvis Bay**
- **Shipped to international markets such as Europe, India, and China**
- **Large Size Mine – 63 Mtpa ROM**
- **Greater than 60 year plus life of mine**



# So Why Iron Ore?

- Following the creation of an iron ore spot price in 2009 the market completed a super up-cycle which started in early 2000's and ended about 2014-15
- 2019-2020 clearly marks the dawn of a new seaborne super-cycle driven by fundamentals
- The reason for the iron ore price rise is **increasing demand and reduced supply**.
- Iron ore gained the title of best performing metal commodity of 2020.
- Strong Chinese demand and reduced supply created the right environment for enhanced price action, further fueled by market momentum.

30 Year - Historical Iron Ore Price  
*2020 – Start of a Strong New Cycle with Solid Fundamentals*



Source: Index Mundi

➤ With emerging markets modernizing their infrastructure and striving for a middle-class lifestyle, demand for commodities continues to soar. Top of the list is iron ore because it's a core component in the production of steel. Asian steel producers are making steel products in a variety of forms including steel rebar, steel plates and hot rolled coils. Steel is also extensively used in ship building, construction, and various manufacturing procedures.

➤ **Demand is not just coming from China**

➤ There is a massive amount of new integrated steelmaking capacity planned for Southeast Asia in the next few years.

IRON ORE Commodity

**174.94** +0.82 (+0.47%)

Official Close 3/4/2021 MI Indication

Add to watchlist

Trade Now

Intraday

1w

1m

6m

Ytd

1y

**3y**

5y

Max

Indicators

Mountain-Chart



***Why Magnetite:***

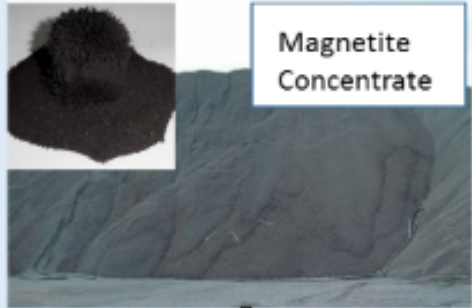
***The trend is for cleaner higher grade ores like the XIF magnetite iron ores at 65%+ Fe are gaining a more important place in the market.***

***Where they are getting larger and larger premiums over the base level. Magnetite is also seen as "greener" also as they use less energy per unit volume of steel generated.***

# The Benefits of Magnetite

[See link here for a video by Karara Mining showing the benefits of magnetite deposits like the XIF project: Magnetite \(Karara Mining Video\) - YouTube](#)

# Further Beneficiation Options



Direct Reduction Iron (DRI) "sponge iron" product (90-99% Fe) or similar higher-grade Fe products using coal-based beneficiation technologies



Further Beneficiate to a Direct Reduction Iron (DRI) "sponge iron" using coal beneficiation technology

- Midrex
- IMBS
- Tenova Pyromet
- ESS prodilux – GLPS



Sell higher priced products to Southern African Market



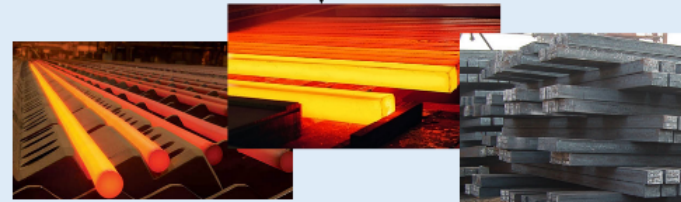
Use either Internationally or for Botswana Steel Industry



Process DRI to steel using an electric arc furnace.

Either onsite or at a steel making hub, Ghanzi, Selebi Phikwe - Pula Steel Electric Arc furnace?

Or buy Pula Steel or new furnace and move to a new steel making hub?

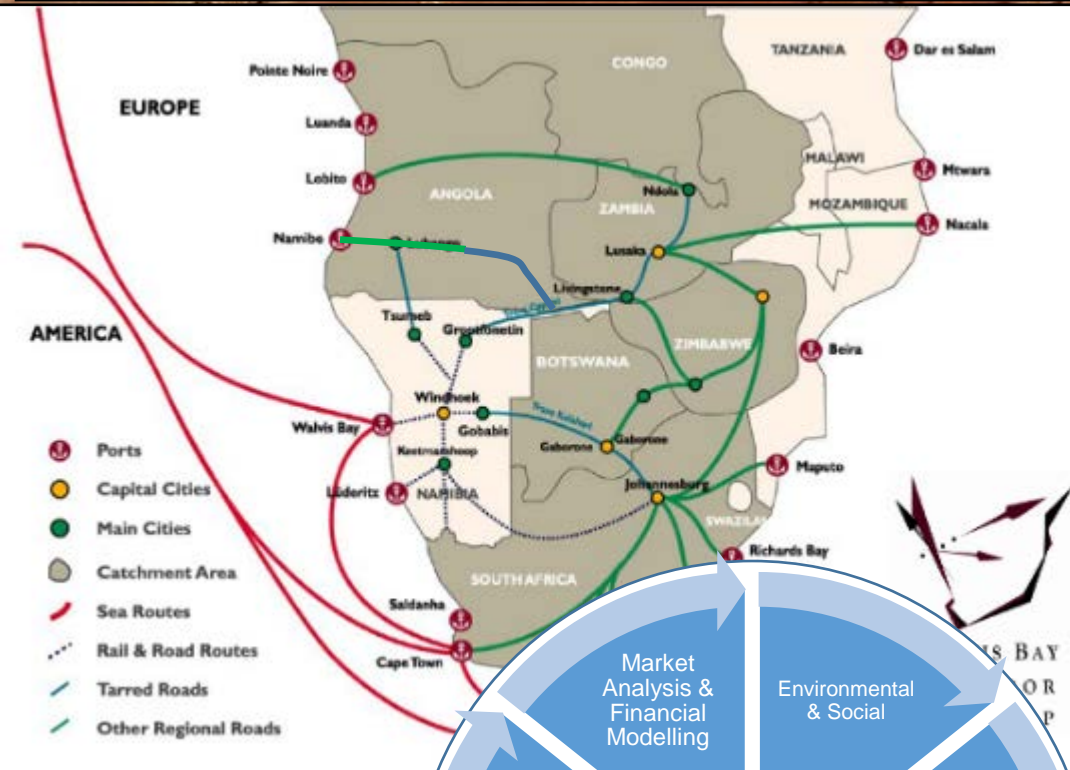


**Direct Reduction Iron**  
**Sponge Iron**

**Uses Coal - Can be feed into Electric Arc Furnace**

**Revitalizing the Steel Industry in Botswana**

# The Next Stage – Preliminary Economic Assessment (PEA)



- Environmental Study
- Economic Viability of the project best Option and Approach
- Trade-off studies for achieving the project objectives
- Process Design Criteria (PDC)
- Process description
- Principle equipment definition
- Principle Opex calculations for the plant
- Block Flow Diagrams (BFD's) for beneficiation options
- Preliminary capital and operating cost estimates
- Assessment of the positive impact to the Botswana economy given its drive to diversify its economy away from Diamond based revenue
- PEA will review:
  - Infrastructure
    - Mine, plant, beneficiation
    - Transport road and rail
    - Water supply
    - Electrical power availability
    - Housing, and communications
  - Human Capacity building local employment and skill development generated
  - Technology + methodology improvements (green tech)

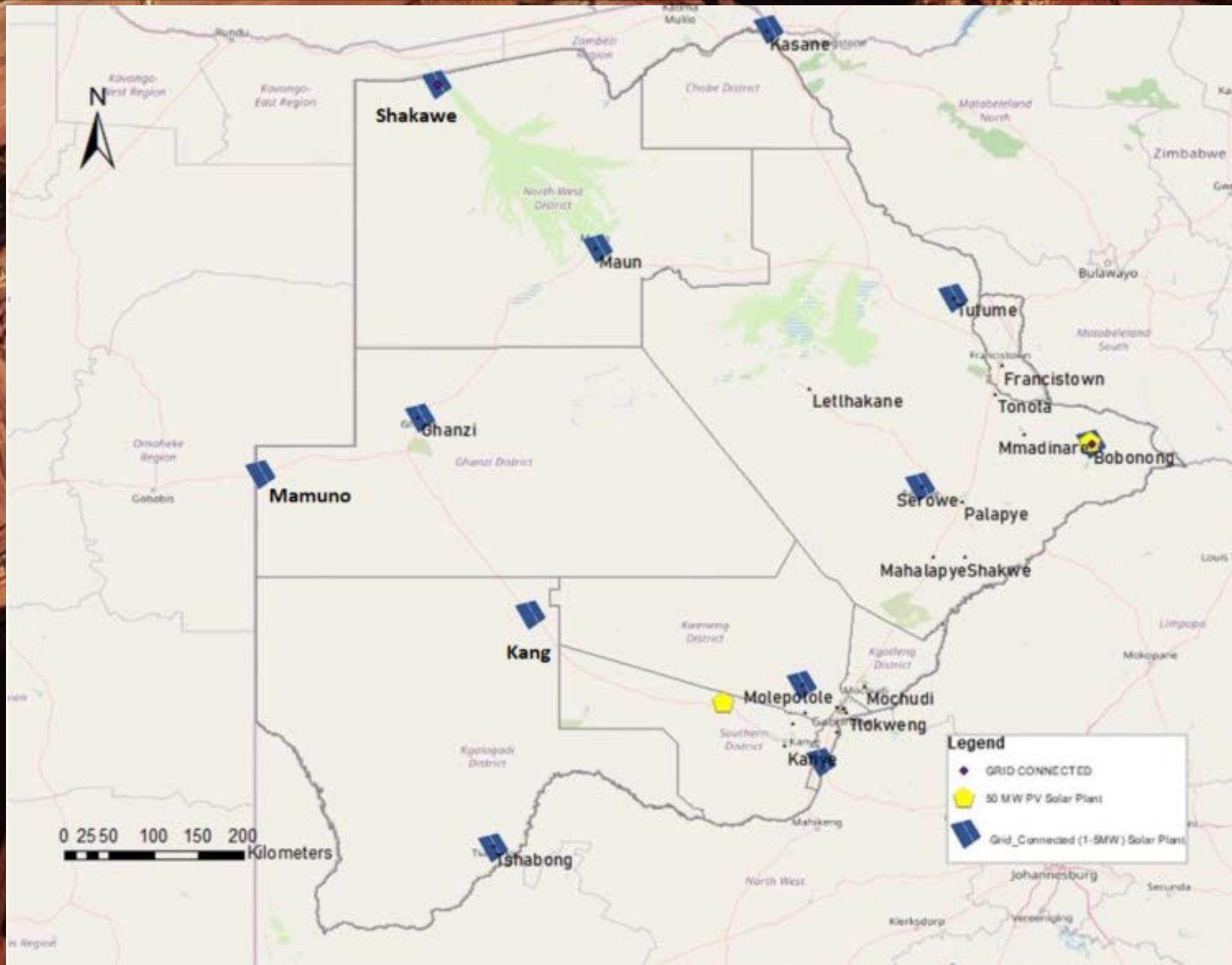
**Infrastructure Project**

# Mining Requires Power Upgrades: 132 kv upgrade already underway



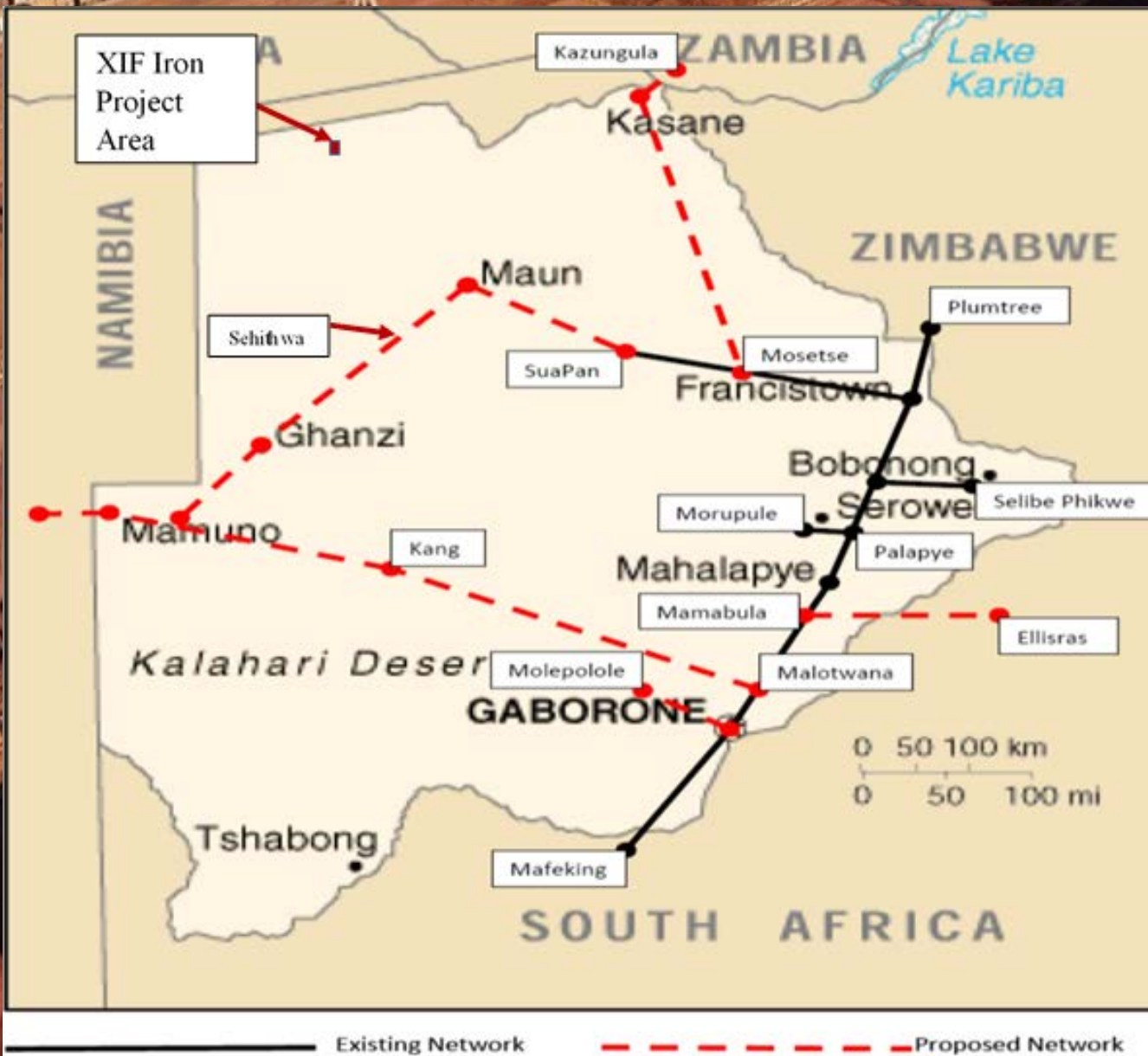
- Northwest Transmission Grid Construction (NWTGC Phase 1);
  - Work in progress ~90% complete
  - Completion December 2020
- Northwest Transmission Grid Construction (NWTGC Phase 2);
  - Project Preparation Complete
  - Anchor Customer Development
  - Awaited

# Renewable Energy Development



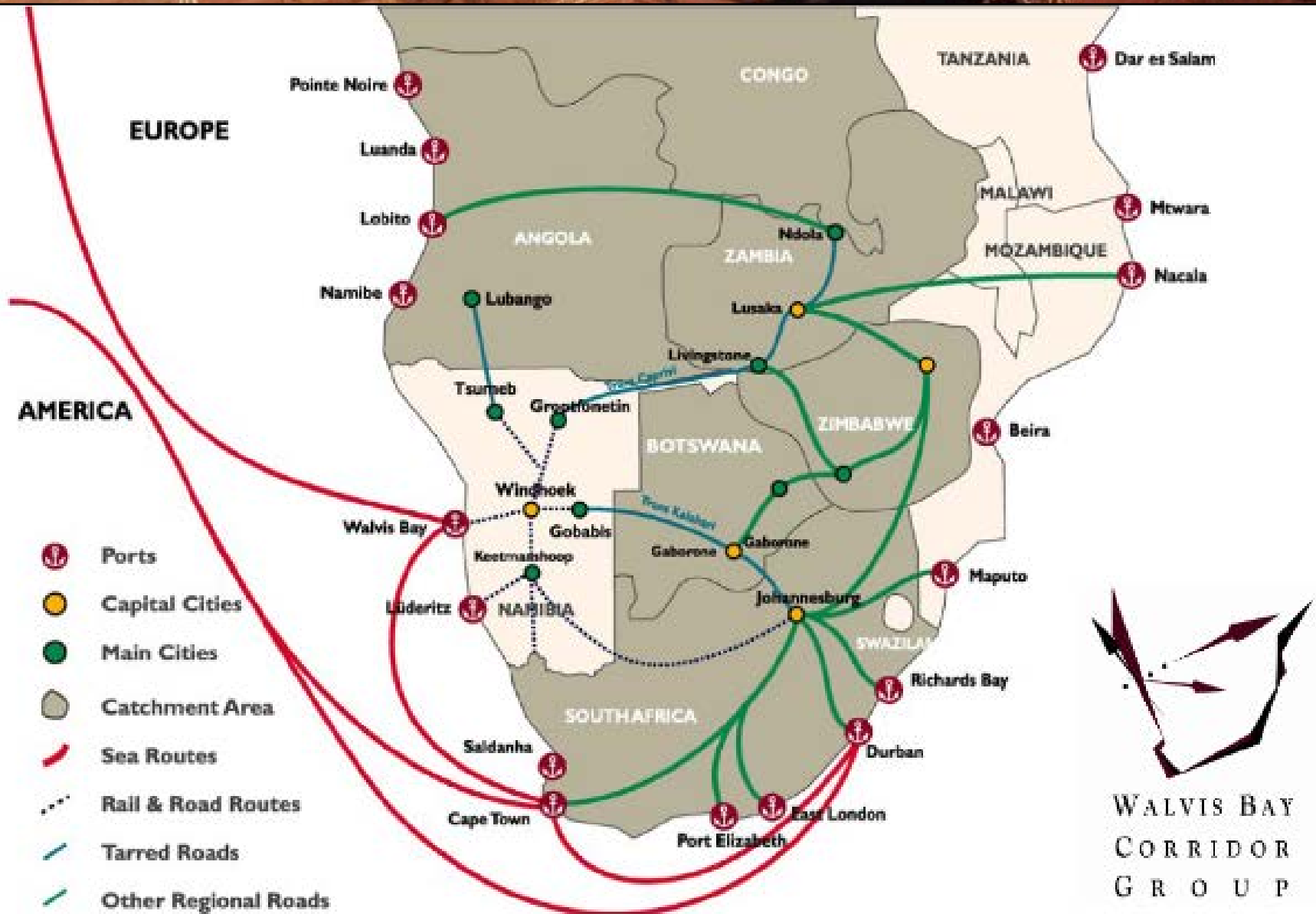


# Large scale Mining Requires Transport: – Rail Network Upgrades

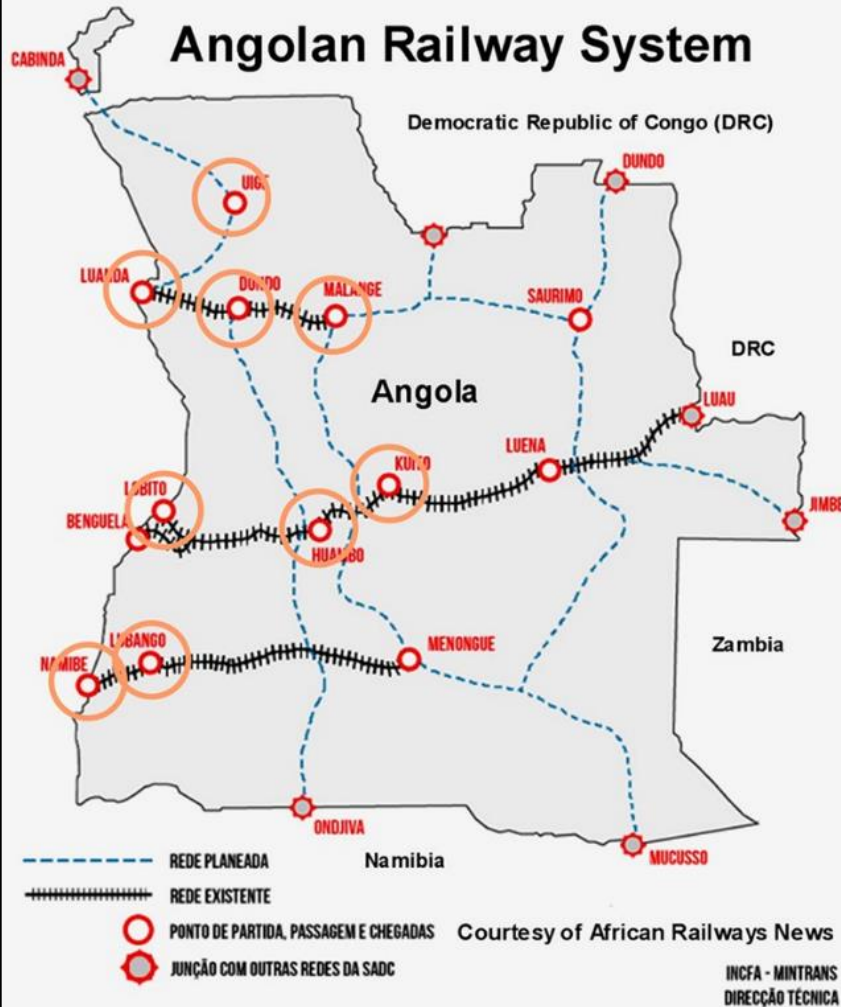


- **Mosetse-Kazungula rail line**
  - Soda ash
  - Salt
  - Copper
  - Agricultural products & supplies
  - Fuel
  - Cement
- **Mmamabula-Lephalale**
  - Coal
  - Containers
  - Soda ash
  - Salt
- **Trans Kalahari Rail line**
  - Iron Ore and products
  - Containers
  - Coal
  - Fuel
  - Copper
  - Beef

# Large scale Mining Requires Transport: – Rail Network Upgrades



# Large scale Mining Requires Transport: – Rail Network Upgrades



- Mucusso (near Caprivi Strip) to Namibe Port
- On road from Mohembo and Shakawe, via Divindu in Namibia to Mucusso
- Shakawe to Mucusso is only 69km
- New Rail leg from Huambo to Mucusso

# Iron Project Conclusions –Major Mining Project

- Potential Massive project
- Potential mine life of over 60 years
- Development of Ngamiland (NW Botswana) one of Botswana poorest regions
- Potential for employment of thousands of Mbotswana
- Could generate huge revenues for the population and taxes for the Government to move away from reliance on Diamond revenue



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