# Agbaja Project

# UPDATED Scoping Study

JULY 2022

ASX RELEASE

KOGI IRON LIMITED

ABN 28 001 894 033

## Cautionary Statement

The Updated Scoping Study referred to in this announcement has been undertaken to ascertain whether a business case can be made to continue more definitive studies on the viability of the Agbaja Iron Mining and Steel Project (the Project). It is a preliminary technical and economic study of the potential viability of developing the Project. It is based on lower-level technical and preliminary economic assessments and is insufficient to support estimation of Ore Reserves. Further evaluation work and appropriate studies are required before Kogi Iron Limited (the Company) will be in a position to estimate any ore reserves or to provide any assurance of an economic development case.

Approximately 92% of the life of mine (LOM) production is in the Indicated Mineral Resource category and 8% is in the Inferred Mineral Resource category. The Company has concluded that this is reasonable grounds for disclosing a production target. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that any further exploration work will result in the determination of further Measured or Indicated Mineral Resources or that the production target or preliminary economic assessment will be realised. The Company is satisfied that the respective proportions of inferred mineral resources are not the determining factors in project viability.

The Updated Scoping Study is based on the material assumptions outlined elsewhere in this announcement. These include assumptions about the availability of funding. While the Company considers all the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Updated Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Updated Scoping Study, funding in the order of USD 557 million will be required. Investors should note that there is no certainty that the Company will be able to raise that amount of funding when needed. It is also likely that such funding may only be available on terms that may be dilutive to or otherwise affect the value of the Company's existing shares. However, the Company has concluded that it has a reasonable basis for providing the forward-looking statements included in this announcement and believes that it has a "reasonable basis" to expect it will be able to fund the development of the Project. It is also possible that the Company could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the project. If it does, this could materially reduce the Company's proportionate ownership of the project.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Updated Scoping Study.

## Competent Persons Statement

The information in this announcement that relates to Mineral Resources for the Agbaja Project is based on information compiled by David Slater, Principal Resource Geologist of Coffey Mining who is a Chartered Professional Member of The Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. Mr Slater has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.

With reference to previously reported Mineral Resources, the Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

## Forward-Looking Statements

This announcement contains "forward-looking statements". All statements other than those of historical facts included in this announcement are forward-looking statements. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. However, forward-looking statements are subject to risks, uncertainties and other factors, which could cause actual results to differ materially from future results expressed, projected or implied by such forward-looking statements. Such risks include, but are not limited to metals price volatility, currency fluctuations, increased production costs and variances in ore grade or recovery rates from those assumed in mining plans, as well as political and operational risks and governmental regulation and judicial outcomes. The Company does not undertake any obligation to release publicly any revisions to any "forward-looking statement".

# Kogi Iron Limited ('Kogi' or 'the Company') is pleased to release an Updated Scoping Study for the Agbaja iron ore mining and steel billet project located in Nigeria, Africa ('the Project').

## Updated Scoping Study Basis

- This Updated Scoping Study provides guidance on the latest input assumptions and results of the Feasibility Study work completed to date
- Updated Steel market pricing projections following the completion of the Fastmarkets market feasibility study completed in June 2022
- Includes the mine planning and metallurgical processing designs
- Updated capital and operating cost estimates as previously completed by independent consultants to make provision for revised inflation and other input costs adjustments.
- The Updated Scoping Study shows an improvement in the economic metrics and business case for the Agbaja Project
- The Feasibility Study is estimated to be completed during the first half of 2023.
- Recent market research confirms a compelling business case for import replacement, magnified by the size of planned production and changes in domestic steel market dynamics resulting from the Ukraine/Russian conflict.

## Background to the Updated Scoping Study

The Company is currently undertaking a Feasibility Study on the Agbaja Project, which is planned to mine iron ore and produce competitively priced steel billet for the Nigerian domestic market. The cornerstone for the Project is the Agbaja iron ore deposit, which has a Mineral Resource Estimate ("MRE") of 586.3 Mt @ 41.3% Fe (Refer ASX Announcement 10 December 2013) and is of suitable quality and size to feed a long-term operation.

This Updated Scoping Study was completed as part of the ongoing Feasibility Study program utilising the Scoping Study released in December 2021, the 2022 Fastmarkets Market Feasibility Study (base case), and updated operating and capital cost inputs. Input costs have been adjusted to account for an increased inflation projection. Adjusted energy costs and other input have been updated but are based on the work completed and referred to in the Scoping Study released in December 2021.

The Updated Scoping Study is an important element of the feasibility process and highlights the key project attributes and assumptions to allow a better understanding of the inherent value of the Agbaja project.

The balance of the Feasibility Study will comprise additional test work, additional environment permitting, detailed mining and plant design, resource upgrade if required and other study aspects. The remainder of the feasibility program is expected to be completed during the first half of 2023.

**Kogi Irons' non-executive chairman Sean Gregory commented: "Kogi Iron is thrilled with these updated financial metrics for the Agbaja Iron and Steel Project in Nigeria. The results from recent base-case price forecasts produced by Fastmarkets, a leading steel and commodity price consultant and released to the ASX in June 2022 has resulted in the Company elevating, amongst other things, the potential financial returns for the project from approximately 14% Internal Rate of Return (IRR) to approximately 33% IRR. All projects must compete for capital, and with these results our ongoing investment in the feasibility studies at Agbaja is reaffirmed and should attract the interest of additional investors."**

## Updated Scoping Study Summary

The key metrics and outcomes of the Updated Scoping Study are:

- Based on mining a small proportion of the **586Mt @ 41.3% Fe** Indicated and Inferred Mineral Resource
- Mining production rate of **1.7 Mtpa** at an average grade of **46.7% Fe** for an initial **25-year** operation.
- More than **92%** of the Mineral Resource scheduled for mining is from the Indicated Resource classification
- Mining strip ratio **0.5:1** (waste ore)
- Steel billet production rate of approximately **500,000 tpa**
- Mining and steel billet operating costs of approximately **USD 502/ billet tonne**
- Capital requirement approximately **USD 557 million**
- At **USD 1,024/tonne** steel billet price:
- $NPV_{10}$ of approximately **USD 1.4 billion** (after-tax)
  (approximately AUD 2.0 billion (1 AUD- 0.70 USD ))
- IRR of approximately **33%** (after-tax).
- Payback of **4 years** (after-tax) from start of development.
- The Company is envisaged to operate the steel billet and casting plant and contract the mining of the open pit mine and the project power generation plant.

## Executive Summary

The Updated Scoping Study has demonstrated the potential for strong financial metrics for the Agbaja Project (Table 1) based on a proposed stand-alone open pit mine supplying a conventional crushed, screened, scrubbed iron ore product to a steel billet plant located at the project site.

The Company considers the Project to be technically low risk given the present understanding and the amount of test work completed on the metallurgy of the conversion of iron ore into a steel billet product.

The Updated Scoping Study was completed to an overall ± 30% accuracy using the key parameters and assumptions set out in Table 1 and as further outlined in Appendix 1. The Material Assumptions that underly the Study are provided in Appendix 2.

The Updated Scoping Study delivered the following production and financial results (changes to the December 2021 Study are highlighted in **blue**):

| Metric | Updated 2022 Scoping Study | December 2021 Scoping Study |
|---|---|---|
| **Economic Analysis** | | |
| NPV @ **10% (After-Tax)** (2021 Study 8%) | **Approximately USD 1.4 M** | Approximately USD 273 M |
| Internal Rate of Return (IRR), After-Tax | **Approximately 33%** | Approximately 14% |
| Average Annual Cashflow (After-Tax)[1] | **Approximately USD 213 M** | Approximately USD 74 M |
| Undiscounted Cumulative Cashflow (After-Tax)[1] | **Approximately USD 5,540 M** | Approximately USD 1,345 M |
| Pay-Back Period (After-Tax) | **Approximately 4 years** | Approximately 6 years |
| Nigerian Steel Billet Price Assumption (2023-2032) | **USD 1,024 / billet tonne** | USD 550 / billet tonne |
| **Capital Costs** | | |
| Direct Capital | **USD 496 M** | USD 450 M |
| Indirect Capital | **USD 61M** | USD 57M |
| Total Capital | **USD 557M** | USD 507M |
| **Operating Costs (Average LOM)** | | |
| Mining | USD 19 / billet tonne | USD 19 / billet tonne |
| Steel Casting Processing & Support | **USD 335 / billet tonne** | USD 233 / billet tonne |
| Power Cost | **USD 145 / billet tonne** | USD 135 / billet tonne |
| General & Administration (G&A) | USD 3 / billet tonne | USD 3 / billet tonne |
| Total Operating Cost | **USD 502/ billet tonne** | USD 390/ billet tonne |
| **Production Data** | | |
| Initial Life of Mine | 25 years | 25 years |
| Mining Rate | 1.7 Mtpa | 1.7 Mtpa |
| Total crusher feed mined | 41.6 Mt | 41.6 Mt |
| Fe (Average) | 46.7 % | 46.7 % |
| Contained Fe | 19.4 Mt | 19.4 Mt |
| Scrubbing Fe Yield | 51% | 51% |
| Metallurgical Recovery (Hot Metal: Scrubbed Ore Contained Fe) | 93% | 93% |
| Metal from external scrap (total scrap to billet ratio) | 33% | 33% |
| Average Annual Steel Billet Production | 500,000 t | 500,000 t |
| Total steel billets produced over 25 years | 12,325,000 t | 12,325,000 |

Table 1: Initial 25 Year Project Summary

## Sensitivity Analysis

Sensitivity of the Project economics to key input parameters including steel price, total capital cost and operating cost was completed to evaluate the relative strength of the Project. The after-tax sensitivity analysis is presented in Figure 1 below.

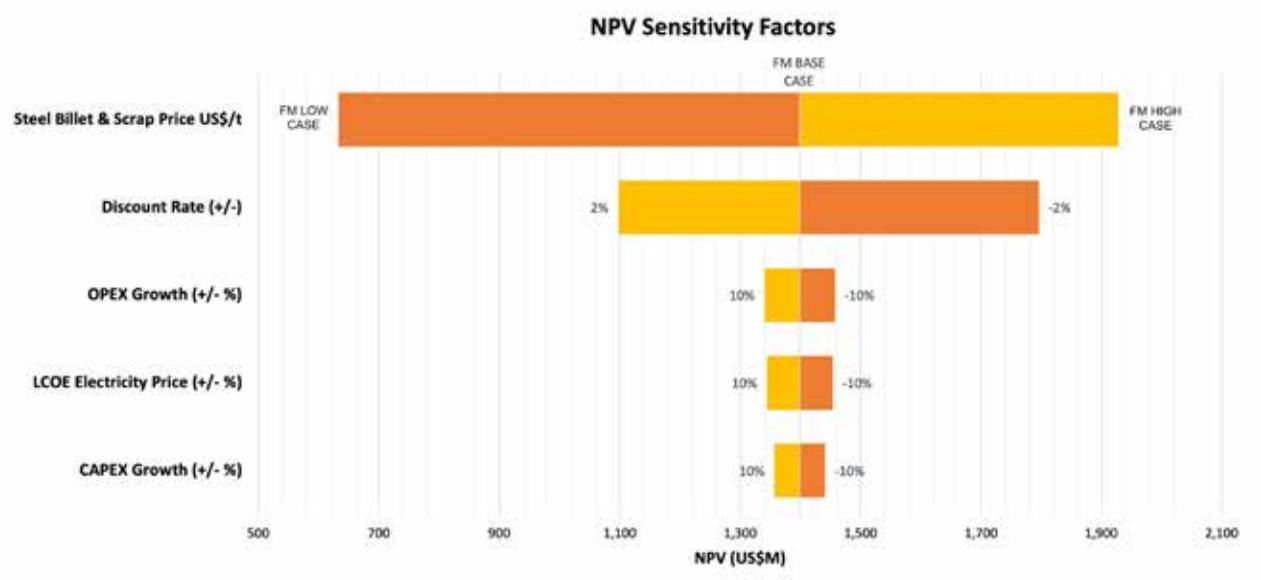


Figure 1: Sensitivity Analysis (after-tax)

For more information about the Company and its projects, please visit our website www.kogiiron.com or contact:

Sean Gregory, Chairman
T +61 (03) 9692 7222
E info@kogiiron.com

# Contents

# Appendix 1
# Agbaja Updated Scoping Study Summary

### Introduction and Background to the Agbaja Project

**The Company plans to develop an integrated mining operation and processing facility to produce steel billets at its wholly owned Agbaja project located in Kogi State, Nigeria. 10 The steel billets produced will primarily be sold in Nigeria to satisfy domestic demand as an import replacement product with some limited potential for export to neighbouring African countries. The Company is currently undertaking a Feasibility Study.**

Kogi Iron Limited (Kogi, Kogi Iron or the Company) is an Australian company listed on the Australian Stock Exchange (ASX) with the objective of becoming an African iron ore and steel billet producer through the development of the Agbaja iron ore mining and steel casting project located in Kogi State, Republic of Nigeria, West Africa (Agbaja or Agbaja Project). The Company holds 5 Mining licenses and 1 Exploration licenses in Kogi State.

Agbaja Plateau edge showing exposed Oolitic iron ore boulder in the foreground.

The Agbaja Plateau is located 200km south west of the national capital of Abuja in Nigeria. The Niger River bisects the plateau to the east and west with the western plateau driving the river to the south east and on for 300km to the south into the Niger Delta.

The nearest major city to the Project is Lokoja, Kogi State which has a population of approximately 3.3 million and is located on the banks of the Niger River, approximately 15 km by road from the proposed mine and process plant. Lokoja is the Kogi State capital, housing state parliament and state government offices. There is a sealed highway passing through Lokoja.

Water for the area is sourced from either the Niger River or plateau ground water supply. Residential power and gas supply are available within the region.


Figure 2: Agbaja project site location

## Agbaja Project Strategy

### Study Level

The technical work completed on the Agbaja Iron and Steel Project is in many cases at a level of detail far exceeding that of a typical Scoping Study. The Updated Scoping Study is informed by the 2021 Scoping Study. Information is also utilised from Pre-Feasibility Study (2014 PFS) on a project based on a different scope than that now proposed as previously it was contemplated to beneficiate the Agbaja Iron Ore for export. However, much of this work including the mine plan and mining approvals is still relevant to the current project. Furthermore, Kogi processed a 50t bulk sample to make 50kg of on-spec steel billets in 2018, a scale of testwork not normally included in a Scoping Study (Refer ASX Announcement 25 September 2018).

The reason for publishing an Updated Scoping Study is to revise the Scoping Study release in December 2021 with significant changes to the sales projection following the completion of the Fastmarkets market feasibility study released in June 2022. The Company has taken the opportunity to also update other key inputs likely to change as a result of a revised outlook for energy cost, inflation and the recent impact of the Ukraine/Russian conflict. The detailed work on the Feasibility Study for the Project is ongoing. Amongst other things this work includes the pilot scale testwork, progressing Front End Engineering Design and the power and energy study. The Feasibility Study is targeted for completion first half of 2023.

### Import Replacement

Nigeria currently imports its steel billets from Europe historically dominated by the supply from Ukraine and Russia, at elevated prices, despite the in-country endowment of Iron Ore on the Agbaja plateau. As the largest economy in Africa, it is of national significance for Nigeria's ongoing economic development to establish in-country iron and steel capability for employment, economic development and strategic security.

### Competitive Advantage

While the Agbaja Iron Ore Deposit is of low quality compared to the average of seaborne traded iron ores, this quality disparity is easily dealt with through existing well- understood steel-making technologies by right-sizing each process step to appropriately remove the diluents effectively. This is best demonstrated by the process of removal of phosphorus, inherent in Agbaja iron ore, which is easily dealt with in the final refining step of the hot metal processing.

The Updated Scoping Study and the Scoping Study release in December 2021 demonstrate that the additional cost associated with processing lower grade ore is offset by the low strip mining and significant capital and operating cost savings by selling final product domestically rather than shipping iron ore internationally and shipping finished product back into the country. The Project cost of iron ore fed to the mill is less than USD 20 per tonne of billet. By comparison an alternative international steel mill would need to import the iron ore for USD 100/t for 62% Fe – i.e. USD 160 per dry metric tonne unit of iron to compete with that primary economic metric. This is a key competitive advantage for the Agbaja project.

### Green Credentials

The process employed in the Agbaja Iron and Steel project offers a significant reduction in greenhouse gas emissions compared to traditional iron making in a blast furnace. Energy is not supplied by burning coking coal for heat and reductant, but rather through electricity in the electric arc furnace (EAF). The electricity is planned to be generated through a combined cycle dual-fuel turbine, which is also an environmental improvement from burning coking coal to produce heat and provide carbon to reduce the iron ore. The CO2 budget for the project will be a key area to quantify and demonstrate these advantages in the Feasibility Study.

## The Agbaja Project

The Project is 100% owned by Kogi Iron Limited and its wholly owned subsidiaries, KCM Mining Holdings Pty Limited and KCM Mining Limited.

The cornerstone for the Project is the Agbaja oolitic iron deposit, which has an MRE of 586.3 Mt @ 41.3% Fe, 80% of which is in the Indicated category (refer ASX Announcement 10 December 2013). Of this global figure 405 Mt @ 45.1% Fe (79% Indicated) is from the Oolitic Zone B and is of suitable quality and size to feed a long-term operation. Only 41.6Mt of this is required for the 25 years considered in this Updated Scoping Study. The Mineral Resource covers only 14.65 km$^2$ of the 142 km$^2$ of prospective plateau covered by the Company's tenements

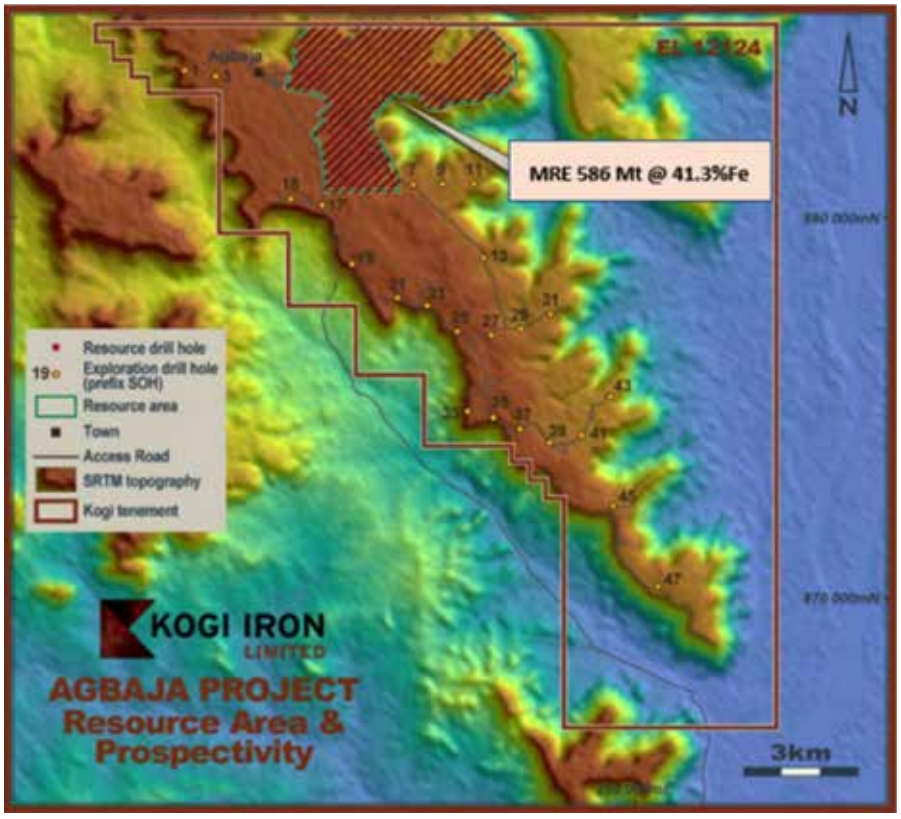


Figure 3: Agbaja Plateau – Resource area and prospectivity

Apart from iron ore, other raw materials important for the steel billet manufacturing process, such as coal and lime, can be sourced from within Nigeria within close proximity to the Project. Exporting unprocessed iron ore is currently not planned and does not form part of this Updated Scoping Study, but will continue to be assessed as part of the ongoing Feasibility Study.

The Company plans to develop an integrated steel billet plant utilizing the iron ore mined at the Agbaja project site. Laboratory and pilot scale metallurgical tests, utilizing a representative sample from the Agbaja iron ore deposit, have demonstrated the ability to produce commercial quality steel billets (refer ASX Announcement 25 September 2018).

A market Feasibility Study undertaken by Fastmarkets in 2018 (refer ASX Announcement 16 January 2019) and confirmed in the Fastmarkets Feasibility study completed in June 2022 reported steel billets are supplied into the domestic Nigerian market by either local producers, who process scrap steel using either induction furnace or electric arc furnace (EAF) processes or steel billets, or are imported. No steel billets are produced in Nigeria from iron ore mined in the country.

Both Fastmarkets studies concluded, subject to various assumptions, that there is likely to be sufficient market demand for Agbaja produced steel billets of the volume contemplated by the Company. In June 2022 Fastmarkets provided updated Nigerian imported steel billet pricing data and this has allowed the Company to update its steel billet pricing projections for this Updated Scoping Study.

Reliable and affordable power supply is critical for the production of steel billets. As part of the Feasibility Study underway, the Company is running several project power generation scenarios. The Company considers the existing Nigerian power grid is unlikely to have the capacity to supply the energy demand or load stability required for the project. For the purposes of this Updated Scoping Study, the power solution elected is a combined cycle natural gas turbine package. The Updated Scoping Study assumes the power generation facilities would be operated via a Build Own Operate (BOO) agreement with a third party. Control of power generation can be viewed as a considerable de-risking of the project. Additional analysis is being undertaken to select the ultimate power solution for the project.

Road and river transport is in close proximity to the project.

The proximity to Lokoja provides access to many local services and labour.

## Geology and Mineralisation

The Agbaja Formation and the iron mineralisation is laterally and aerially extensive across the Agbaja Plateau and consists of an upper unit comprising beds of ferruginous sandstone and reworked oolite/pisolite material (referred to as the Laterite unit) that overlies a sequence of massive ferruginous oolite and pisolite in a ferruginous matrix.

The Company holds a land position of approximately 142 km2 covering 6 tenements in Kogi State, Nigeria, with the main focus currently being ML24606. The Agbaja Plateau hosts an extensive, shallow, flat-lying channel iron deposit and Mineral Resources.

### Mineral Resource Estimate

On 10 December 2013, Kogi Iron released an Updated Mineral Resource estimate of 586 million tonnes with an in-situ iron grade of 41.3%. This Updated Mineral Resource includes Indicated Mineral Resources of 466 million tonnes at 41.4% Fe, with the balance of the Mineral Resources classified as Inferred (120 million tonnes at 41.1% Fe) (Table 2).

| 2013 Indicated and inferred mineral resource | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Classification** | **Tonnes (Mt)** | **Fe (%)** | **$SiO^2$ (%)** | **$Al_2O_3$ (%)** | **P (%)** | **LOI (%)** | **CaO (%)** | **$K_2O$ (%)** | **MgO (%)** | **Mn (%)** | **Na2O (%)** | **S (%)** | **$TiO^2$ (%)** |
| **Zone A (Laterite Mineralisation)** | | | | | | | | | | | | | |
| Indicated | 147.5 | 33.2 | 24.24 | 14.77 | 0.32 | 1 0.4 | 0.03 | 0.07 | 0.07 | 0.05 | 0.02 | 0.04 | 0.98 |
| Inferred | 33.9 | 31.7 | 26.15 | 15.04 | 0.30 | 10.3 | 0.04 | 0.07 | 0.07 | 0.04 | 0.01 | 0.04 | 0.98 |
| **Total Indicated + Inferred (Zone A)** | **181.4** | **32.9** | **24.60** | **14.82** | **0.31** | **10.4** | **0.03** | **0.07** | **0.07** | **0.04** | **0.02** | **0.04** | **0.98** |
| **Zone B (Oolitic Mineralisation)** | | | | | | | | | | | | | |
| Indicated | 318.7 | 45.2 | 10.54 | 10.51 | 0.92 | 10.8 | 0.22 | 0.01 | 0.08 | 0.09 | 0.02 | 0.08 | 0.25 |
| Inferred | 86.3 | 44.7 | 11.25 | 10.73 | 0.87 | 10.8 | 0.13 | 0.01 | 0.07 | 0.07 | 0.01 | 0.05 | 0.26 |
| **Total Indicated + Inferred (Zone B)** | **405.0** | **45.1** | **10.69** | **10.56** | **0.91** | **10.8** | **0.20** | **0.01** | **0.08** | **0.08** | **0.02** | **0.07** | **0.25** |
| **Combined Zone A and Zone B** | | | | | | | | | | | | | |
| **Total Indicated** | **466.2** | **41.4** | **14.87** | **11.86** | **0.73** | **10.7** | **0.16** | **0.03** | **0.08** | **0.07** | **0.02** | **0.07** | **0.48** |
| **Total Inferred** | **120.1** | **41.1** | **15.45** | **11.95** | **0.71** | **10.6** | **0.11** | **0.03** | **0.07** | **0.06** | **0.01** | **0.04** | **0.46** |
| **Total Indicated + Inferred** | **586.3** | **41.3** | **14.99** | **11.88** | **0.72** | **10.7** | **0.15** | **0.03** | **0.08** | **0.07** | **0.02** | **0.06** | **0.48** |

Table 2: The 2013 full grade Tonnage for Laterite (Zone A) and Oolitic (Zone B) horizons (20% Fe lower cut-off is applied)

The Resource is divided into two domains based on geological, metallurgical and assay information. The first domain, Zone A, is described as laterite in geological logging with 20% < Fe < 40%, low phosphorous values and elevated titanium dioxide values. The second domain, Zone B, is described as oolite/pisolite in geological logging with Fe > 30%. The geological/mineralisation interpretation was developed for Zone A (Laterite) and Zone B (Oolite) and used as hard boundaries (wireframes). Where Regularize sandstone lenses lay within and between Zone A and Zone B, the lenses were wire framed separately as internal waste.

The Resource was estimated using Ordinary Kriging (OK) techniques. Variographic analyses were completed on Zone A and Zone B. Search parameters were based on variography carried out on the 1 m composites and supported by geological knowledge gained from field mapping and drill hole data. In addition to Fe, a full suite of elements was also estimated including $SiO_2$, $Al_2O_3$, P, LOI, CaO, K2O, MgO, Mn, $Na_2O$, S, $TiO_2$, P, $SiO_2$ and $Al_2O_3$.

Grades and tonnage are calculated for each domain. An in-situ dry bulk density was calculated using a combination of a 'tray weight' measurement for Zone A and a 'weight in water' measurement for Zone B to estimate the tonnage for each domain. An in-situ dry bulk density of 2.02 t/$m^3$ and 2.28 t/ $m^3$ was calculated for Zone A and Zone B respectively

## Mining Operations

### Overall Mining Philosophy

Kogi will opt for a mining contractor to conduct all site development, overburden and waste removal, open-pit mining including site rehabilitation, haulage and plant feed to a primary crusher. Mining operations will be conducted on a 24/7, 365 days per year basis and it is envisaged that production drilling and blasting will not be required, as all material is soft and friable, and amenable to "free-dig".

A traditional truck/excavator open pit development method was selected for the mine, due to the shallow nature of the deposit and is corresponding low stripping ratio.

### Mining Model

The mining model used for design and scheduling was primarily based on a Maptek-Vulcan sub-blocked model. This model was regularized into 20 m x 20 m x 2 m, using MineSight 3D and was checked against the resource model for replication of the same quantities and qualities.

### Mine Production Schedule

The mining schedule for this Updated Scoping Study is unchanged from the Scoping Study release in December 2021 and was derived from the 2014 PFS Mine Plan. The 2014 PFS mine plan was scheduled in 11Mt annual increments, which were then rescheduled at the 1.7Mt annual increments required for this Updated Scoping Study (Figure 4). Of the 21 years in the 2014 PFS mine plan, only the first 5 increments were required to deliver an initial operation with a 25 year mine life for the purposes of this Updated Scoping Study.

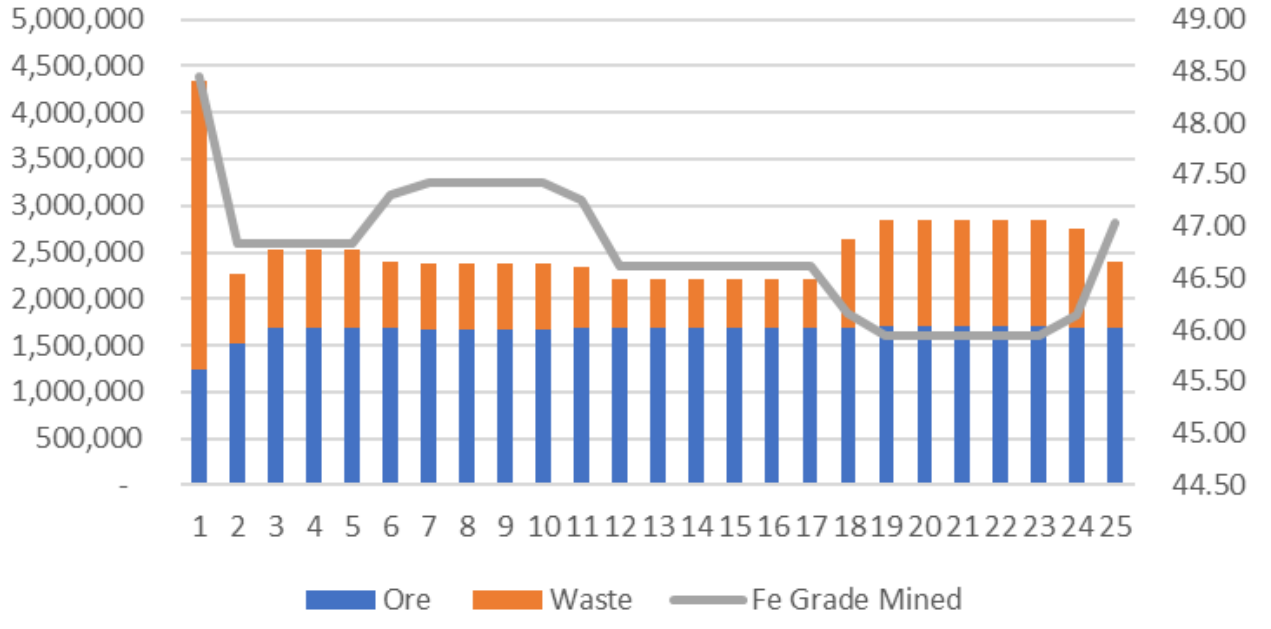


Figure 4: Agbaja Scoping Study Mine Schedule

The completed Updated Scoping Study and 2021 Scoping Study Mine Plan delivers 41.6 Mt of plant feed at a Fe grade of 46.7% at a 0.5:1 Strip Ratio over a 25-year initial mine life (Table 3). Note that this is only 7% of the 586.3 @ 41.3%Fe Mineral Resource, indicating the potential for a very long-life project beyond that considered in this Updated Scoping Study.

| Total Material Mined (Mt) | Waste (Mt) | Mill Feed (Mt) | Fe % | Strip Ratio (W:O) |
|---|---|---|---|---|
| 63.7 | 22.0 | 41.6 | 46.7% | 0.5:1 |

Table 3: Agbaja Mineral Inventory for an initial 25-year life

### Resource Classification in the Mine Schedule

Approximately 92% of the plant feed is sourced from Indicated Mineral Resources (38.3Mt @ 46.7% Fe), and the balance (8%; 3.3Mt @ 46.7% Fe) is from Inferred Mineral Resources (Figure 5). The Inferred Mineral Resource is mined at a steady proportion throughout the Updated Scoping Study Mine Schedule. Figure 5 also illustrates the low risk to this being achieved, with abundant shallow flat lying Indicated Mineral Resources also available for scheduling, but not required in the first 25 years.

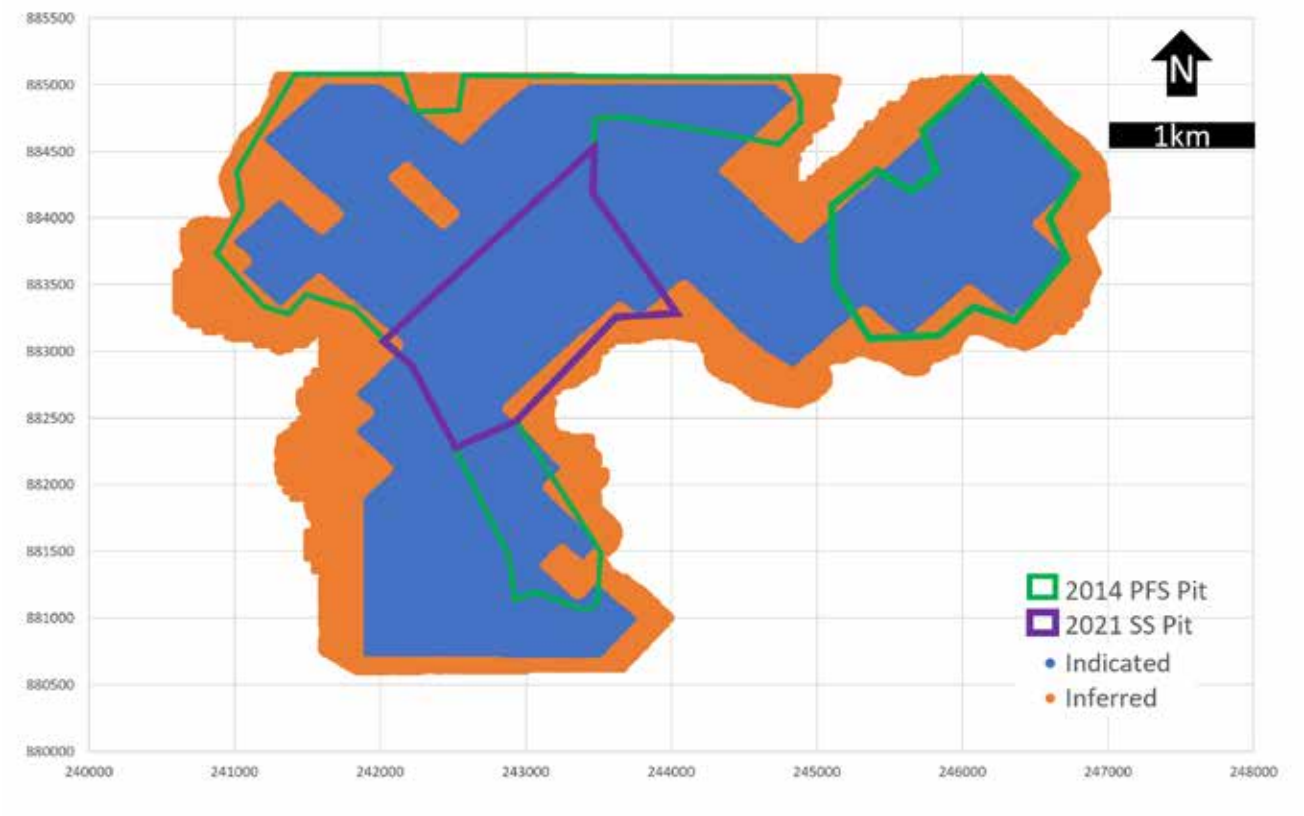


Figure 5: Distribution of Inferred and Indicated Mineral Resources compared to the PFS and SS Pit Designs

Mining costs, inclusive of all contract mining costs (overburden and plant feed) and owner's costs, used in the Updated Scoping Study are estimated as USD 2.83 per dry metric tonne of ore and waste moved. This is sourced from the 2014 PFS which was based on tenders from two leading global mining contractors and escalated by the intervening 7 years for inflation.

The low cost per tonne of plant feed is a reflection of the low 0.5:1 strip ratio, the softness of the Agbaja material, the short-haul distances from pit to plant and pit to waste disposal points, African labour rates and the competitive pricing received from the mining contractors.

### Waste Dump and Pit Backfill

It is envisaged that processed rejects (tailings) and some of the mining waste material will be stored in-pit. An allowance of USD 0.50 per wet metric tonne has been assumed to transport the tailings back to the pit void.

## Metallurgy

The geology and mineralization of the Agbaja iron deposit, consisting primarily of an oolitic type iron deposit, are well described and defined through numerous academic papers and the characterisation work concluded by Kogi Iron during the development of the project. Oolitic iron ores are a distinctive subset of iron ore deposits and are characterised by concentric layers containing hematite and goethite along with impurity elements such as silicon and phosphorus. The Agbaja deposit consists of such oolitic structures, rich in iron oxides, in a predominantly clay matrix.

The iron deposits of the Agbaja region are associated with significant phosphorus associations (Oefoegbu, 2019). Phosphorus is uniformly associated with the iron minerals, and it has been demonstrated that the ore is not amenable to upfront phosphorus rejection through physical upgrading. Bio-leaching techniques considered in the 2014 PFS carried an element of technical risk as a relatively novel method and the product produced still contained elevated phosphorus (>0.2%) that would be difficult to sell at a suitable price on the seabourne market. Kogi Iron has developed and demonstrated a pyrometallurgical process flowsheet through which the phosphorus is effectively and efficiently removed as part of the steelmaking flowsheet (Sylwestrzak et al., 2019). This process is not novel, but is achieved by scaling certain elements of the flowsheet (e.g. the Basic Oxygen Furnace) for additional capacity to remove the phosphorus.

### General Process Flowsheet Description

The metallurgical process flowsheet receives bulk run-of-mine ore containing lumpy and fines generated during the mining process. The overall steelmaking process consists of four process blocks, each with a particular purpose in the production process. The process stages consist of an ore preparation step, followed by three pyrometallurgical processes. The stages of the process flowsheet are presented as a summary Table 4, highlights the key steps in the flowsheet.

| Process aspect | Technology, flowsheet | Purpose |
|---|---|---|
| Ore dressing | Crushing, scrubbing, and screening | Preparation of feed suitable for direct reduction in a rotary kiln. The ore dressing stage rejects fines (-5 mm fraction) and clay components via a simple crushing, scrubbing, and screening circuit. The product, consisting of screened ore with a cut-off particle size of -16+5 mm is produced as feedstock for DRI production. |
| DRI production | Rotary Kiln (RK) | Production of direct reduced iron for the ironmaking process using a rotary kiln with coal as the reducing agent. Rotary kiln technology is robust and widely used in industry for the reduction of iron ores. Rotary kilns are very reliable and ideally suited for use in remote locations. Metallization of the iron in the kiln reduces the electrical energy requirement in the electric furnace and metallization of greater than 85% is targeted. |
| Ironmaking | Electric Arc Furnace (EAF) | Melt reduction of DRI in an open-bath slag furnace to produce crude hot metal as input to steelmaking. The primary objective is to separate the metal from the gangue constituents achieving greater than 95% Fe recovery. Small additions of reductant and fluxes are used to ensure efficient smelting conditions. |
| Refining and casting | Oxygen refining and billet casting | Refining of crude hot metal to meet the product quality requirements, followed by casting of steel billets. Oxygen refining is primarily used to reject the phosphorus in the metal, but also serves as a general refining step for the steel product. |

Table 4 – Flow sheet stages

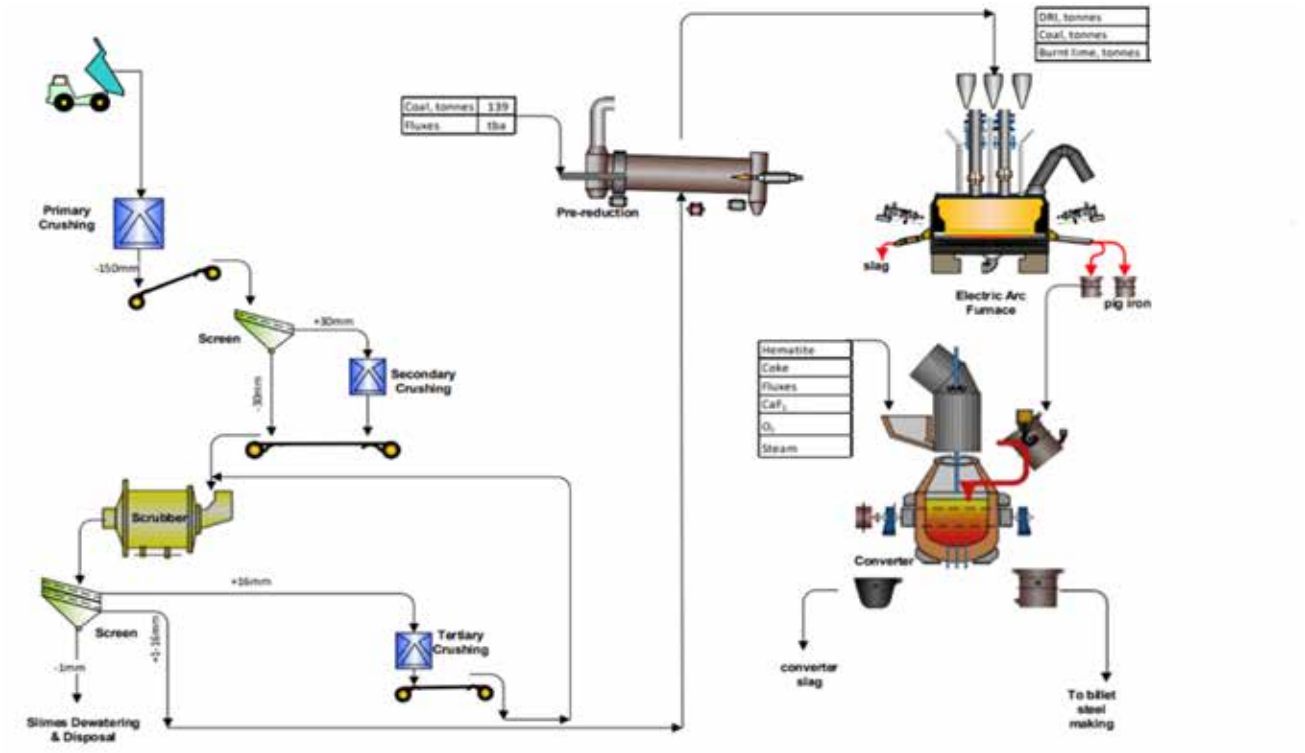


Figure 6: Agbaja process flowsheet

Historical test work conducted by Kogi Iron has included a series of studies initially aimed at preconcentration of the iron ore, and removal of the high phosphorus through a range of process options. The technical solution developed by Kogi Iron overcomes the high-phosphorus content through the innovative use of established steelmaking technology.

The flowsheet was demonstrated through a series of tests using a bulk sample of Kogi iron ore collected from latitude 7° 59' 45.3" north, and longitude 6° 39' 53.2" east in 2017. The bulk sample is representative of the rock type typical of the deposit, namely predominantly a goethite-rich mineralization.

The 50 metric tonne bulk sample was sent to Mintek in South Africa where it was blended, crushed and screened (Figure 7). 10 tonne were beneficiated, 4.2 tonnes of product were sent for pre-reduction, and 50 kg of on-spec crude steel ingots were manufactured (Refer ASX Announcement 25 September 2018). The balance of the bulk sample is presently being prepared for further bulk scale testwork in 2022.

Figure 7: Photographs of bulk sample preparation

**Bulk Sample Processing and Ore Dressing Test Work**

The nature of the ore from the Agbaja deposit was found to be well-suited for a low-pressure washing approach. Tests indicate high losses of iron into the slime fraction mainly due to the friable nature of the ore and it was concluded that conventional rotary scrubbers would be adequate for the Agbaja ore.

Figure 8 Bulk sample preparation – blending of crushed sample prior to scrubbing tests (top), scrubbed product (bottom)

Based on the pre-concentration work the crushed Run of Mine (ROM) ore yields about 48% iron ore product post-scrubbing, with a typical grade ranging from 47% to 50%. In preparation for the direct reduction pilot test work planned for 2022, 16 tonnes of scrubbed product were produced from the bulk sample.

| | Fe | $SiO_2$ | $Al_2O_3$ | CaO | MgO | P | LOI |
|---|---|---|---|---|---|---|---|
| Average typical iron ore grade, after crushing, screening, and washing | 49.3 | 7.8 | 8.4 | 0.5 | 0.1 | 0.95 | 11.4 |

Table 5: Typical average product grade of scrubbed product, washed and graded +16 -5 mm product, mass per cent

**Development Test Work - Production of DRI**

The Company is planning to use a coal-based direct reduction of iron in a rotary kiln furnace which is a well-established technology and widely used to produce direct reduced iron (DRI) due to the simplicity of process and suitability for regions with an abundance of coal or natural gas (Battle et al., 2014).

Rotary kilns are also ideally suited for remote locations due to their reliability, and low complexity to operate.

Nigerian coal has been tested and deemed suitable as a reducing agent for the pre-reduction step (Torex Technical Report, 2018).

As part of the Feasibility Study process a pilot scale rotary kiln reduction test work will be conducted in Sepember 2022 using Agbaja iron ore and Nigerian coal at the FLS test facility in Utah, USA. FL Smidth is a global organization based in Copenhagen, Denmark employing about 12,000 people worldwide. The Company is a recognised provider of rotary kiln technology to both cement and minerals industries globally with a proven track record in the application of direct reduction technology.

**Demonstration Smelting Trial – Iron- and Steelmaking**

The high phosphorus content of the Kogi ore deposit necessitated the development of a flowsheet that could

demonstrate the removal of the phosphorus from the steel product to meet the technical specification of steel. The flowsheet therefore incorporates a dedicated phosphorus removal step. Development of the flowsheet demonstrated the technical feasibility of phosphorus removal from liquid iron produced from Kogi iron ore.

A pilot smelting campaign was conducted at Mintek and completed during the second quarter of 2018. A pilot scale open-arc open-bath furnace was used to demonstrate the melt reduction of Kogi iron concentrate produced from the bulk sample. The smelting test work conducted at Mintek demonstrated the production of crude pig iron by smelting of the Kogi iron ore and allowed for benchmarking the smelting of the ore in an electric arc furnace at a significant scale. The smelting test provided sufficient process information to assist with implementation of the process on a commercial scale.

The smelting test work campaign demonstrated that high iron recoveries are feasible in an open slag bath smelting mode, and iron recovery of greater than 90% was easily achieved during the test.

The phosphorus concentration in the metal was in the range 0.9 to 1.3%, which is as expected, and the metal produced from the smelting trial was used as test material for development of the post-taphole oxygen refining stage to remove phosphorus from the iron.

The typical chemical composition of the crude iron product, prior to refining typically contained about 94% Fe, about 4% C and 1% P. The composition of the crude hot metal from the smelter met expectations, and high iron recoveries were consistently achieved.

The operability and metallurgical performance of the smelting trial demonstrate that the ore from the Kogi Iron deposit behaved as expected, and typical iron smelting performance outcomes were achieved. Dephosphorisation and de-sulphurisation of the crude iron product is standard practice in steelmaking and can be achieved by means of controlled oxygen injection to supply a known oxygen potential into the molten metal bath, as in a typical basic oxygen steelmaking process, with the removal of impurities achieved by strategic fluxing.

The refining test work is focused on effective removal of carbon, phosphorus, as well as minor contaminants, namely, sulphur, silicon, and manganese. The refining of the hot metal was achieved by molten state oxidation of the pig iron.

The target composition of the refined iron (crude steel) was dictated by the impurity specifications of a billet steel making iron and the tests conducted successfully demonstrated that the iron product produced from Kogi's iron ore is amenable to oxygen refining. Oxygen refining of crude steel is an established process and the tests showed that proven technology can be applied to solve the high phosphorus challenge of the Agbaja deposit.

As part of the Feasibility Study Test work by UHT is scheduled for the end of 2022 aimed at generating the necessary engineering parameters for the engineering design of an oxygen converter suitable for Kogi's requirements. The refining technology is established and UHT has a proven track record in steel making. The planned refining test work will be conducted by UHT to optimally test the impact of varied phosphorus content and provide accurate input with respect to cost and consumption data.

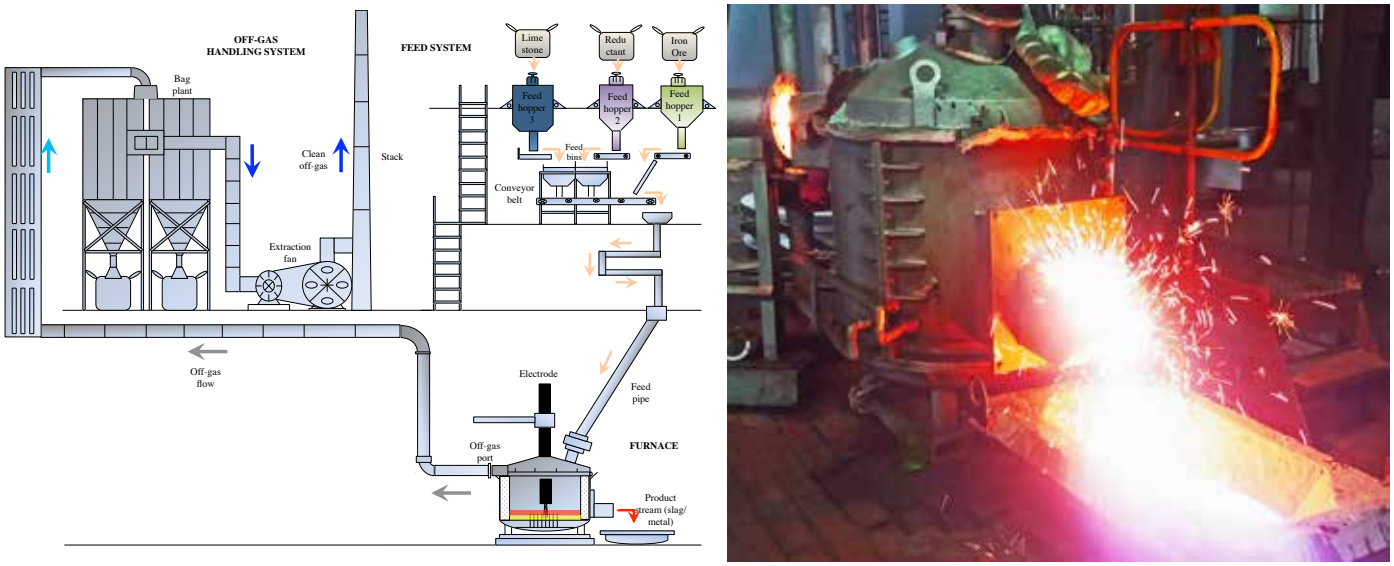


Figure 9 A schematic diagram of the pilot furnace set-up showing the integrated nature of the continuous smelting facility at Mintek (left). The 200 kVA DC arc pilot furnace in operation during the Kogi Iron trail (top right) and metal and slag produced during the trial (bottom right). The crude iron product was used in the oxygen refining development work to demonstrate the successful removal of phosphorus.

**Process Summary / Technology Readiness...**

Typical metrics available thus far:

- ROM ore yields about 49% of graded iron ore chips -16 mm +5 mm with a typical concentration of about 49% Fe.
- Metallization of the iron ore in a laboratory rotary kiln demonstrated that 85% metallization can be achieved using coal from Nigeria as a solid reduction.
- Smelting of the iron ore demonstrated that high iron recovery, greater than 90% is achievable.
- The iron produced from the smelting trial were shown to be amenable to oxygen refining. Samples of iron was shown to meet the impurity requirements of crude steel.

**Block flow diagram 500 ktpa steel billet**


Figure 10 Visualisation of flowsheet

**Processing and Steel Casting**

Following the final steel making process, a continuous casting method will be used to cast steel billets. The principle of the continuous casting method is simple. The liquid steel in a ladle is transferred to the casting machine. When the casting operation starts, the nozzle at the bottom of the ladle is opened and the steel flows at a controlled rate into the tundish and from the tundish through a submerged entry nozzle into one mold or several molds. The molds are generally water-cooled copper molds.

The first solidification takes place at the metal/mold interface. The thickness of the solidified shell increases progressively and at the exit point, the shell of the billet is thick enough to support the liquid metal that remains inside the billet. Water-cooling is deployed to control the mold temperatures. At the end, the strand is cut, and the final billet product is allowed removed. A schematic drawing illustrates the methodology of billet casting (Louhenkilpi, 2014).

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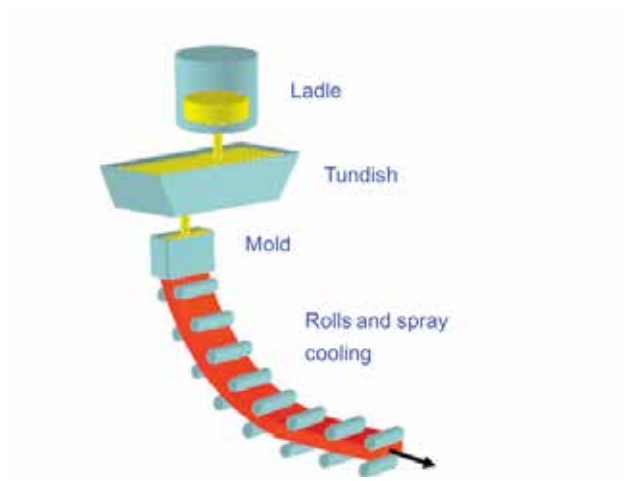


Figure 11 Schematic of a typical continuous casting process (reproduced from Louhenkilpi, 2014

## Power Generation

There is limited suitable grid electricity reticulated within the vicinity of the Project. On initial review and given the requirement to have a reliable power source that satisfies the load demands of steel billet product, the Company has identified the need to construct and control the power generation for the project. It is anticipated that the power plant would be constructed and outsourced as a Build Own Operate (BOO) style contract with a third party.

The Company has identified a number of possible power technologies ranging from solar, hydrogen, hydro, coal fired, natural gas or diesel (dual fuel) turbines, dual-fuel reciprocating engines, including a combination of these technologies. For the Updated Scoping Study the Company has elected to utilise the dual-fuel combined cycle turbine option, noting that optimisation of the power solution will be dealt with during the Feasibility Study. Power represents approximately 29% of the cost of production.

Despite the fact that reliable energy for the steel making process is the overriding priority the company is very clear that it intends to develop the most environmentally effective solution that is viable from both an economic perspective and also the ability to manage within the project setting for whatever technology is selected.

## Project Infrastructure

Infrastructure for the project will include a mining contractor workshop, steel mill workshop, offices, site roads, a fully equipped on site laboratory for process control and a small accommodation facility. An allowance of USD 29M has been included in the capital estimate for this infrastructure.

## Environmental Studies and Permitting

The Company commenced an Environmental Impact Assessment (EIA) in January 2013. The EIA is an assessment of the environmental and social impact of the proposed mining activity at the Agbaja Project, it is a mandatory requirement of the Nigerian Minerals and Mining Act, 2007 (section 119) to be undertaken by a mineral title holder prior to application for the conversion of a mineral title (e.g. Exploration License to a Mining Lease) or prior to the commencement of mining operations.

Greenwater Environmental Services Limited (Greenwater) an FMEnv accredited environmental consultant was commissioned to conduct a detailed Environment Impact Assessment (EIA) of the proposed mining project at Agbaja Plateau in the Lokoja Local Government Area of Kogi State, Nigeria.

Greenwater oversaw the baseline environmental surveys that were carried out for the EIA and specialists from Greenwater (Akure) were engaged to lead the environmental baseline surveys and social studies that supported the EIA.

The Federal Ministry of Environment (FMEnv) approved the Mining EIA in 2015.

During 2022 and as part of the ongoing Feasibility Study the Company will seek to extend the EIA approvals to include the steel billet processing plant located at the mine site.

Figure 12: Site Surveying with the Federal Ministries Lokoja based mines officer.

Figure 13: Environmental Surveying on the Agbaja Plateau

## Marketing And Economic Analysis

### Country

Nigeria is the largest economy in Africa. Although oil and gas extraction only accounts for 40% of the overall economy, it accounts for approximately two-thirds of state revenue.

In turn, government expenditure is crucial for civil engineering construction, while energy industry expenditure also drives non-residential expenditure. Residential expenditure is more impacted by performance in agricultural and service sector economies, which define employment levels and disposable income.

Long steel product demand (and consequently billet demand) is driven by Nigerian construction demand, which in turn will be driven by the Nigerian economy.

The ability for Nigeria's construction sector to grow is linked to the strength of the oil and gas sector.

Based on the Nigerian economic data the general Nigerian construction sector is assumed to grow over the forecast period of 4.6% p.a.

### Project Specific

There are a number of steel mills in Nigeria which are potential customers for Agbaja steel billet. Testwork has shown that high quality steel can be produced from the Agbaja iron ore which should provide a suitable product for these mills.

Economic activity in the Nigerian construction sector directly impacts the demand for rebar (and other steel products). Rebar forms the bulk of steel production in Nigeria.

The Company appointed Fastmarkets in February 2022 who completed a Market feasibility study updating the December 2018 Marketing study The 2022 Fastmarkets study evaluated several growth scenarios for Nigeria, assessing opportunities and risks, which resulted several key conclusions, as released to the market on June 20, 2022, and include:

- Economic growth in Nigeria and other African nations is accelerating after the Covid19 pandemic brought slowdowns and recessions in 2020 and 2021.
- Oil prices have recovered strongly after the weakness of the last 24 months and are holding up, which will see investment in new energy projects.
- Rates of construction growth, the major market for steel long products, are forecast to rise at an average of 4.6% per annum in the years to 2030, with civil engineering construction growing at a slightly faster 5.1% per annum.
- Billet demand is expected to exceed the previous high of 2014 and reach 2.07 million tonnes by 2024, when Kogi Iron's facility is due to start to ramp up.
- In its base case, Fastmarkets forecasts a long-term average billet price of US$1,024/tonne ex-works Nigeria/delivered duty paid (ddp) Lagos in nominal terms over the period 2025 to 2032.

## Financials, Funding and Economic Summary

### Capital Costs

| Plant Area | Total Capex for a 500 ktpa steel billet plant USD '000 |
|---|---|
| Material handling and beneficiation | $26,329 |
| Direct Reduction Plant | $179,730 |
| Electric Arc Furnace | $178,395 |
| Refining and Casting | $96,908 |
| Air Separation Unit | $14,203 |
| **Direct costs total** | **$495,565** |
| | |
| **Additional / owners costs** | |
| EPCM/integration manpower | $29,255 |
| Infrastructure and services allowance | $32,180 |
| **Total estimated capital cost** | **$557,000** |

Table 6 Project Capital Costs

**Operating Costs**

Processing operating costs for the Agbaja Project were estimated by per tonne of material

| DRI Production Cost Summary | DR rotary kilns for 80% metallization | | | USD/t (DRI) |
|---|---|---|---|---|
| | Coal (reductant, fuel) | | | 33.28 |
| | Consumables (fluxes, refractories) | | | 9.38 |
| | Labour & maintenance | | | 6.94 |
| **Total DRI production Cost** | | | | **$49.60** |

| Hot Metal Production Cost Summary | Electric arc furnace DRI at 600°C | USD/t (DRI) | | USD/t (HM) |
|---|---|---|---|---|
| | Electricity | | | 179.28 |
| | Fluxes & reductants | | | 28.44 |
| | Consumables (refractories, other) | | | 11.00 |
| | Labour, maintenance | | | 4.52 |
| | Slag disposal credit | | | -5.16 |
| **Hot metal production cost** | | | | **$218.07** |
| | DRI costs (sub-total) | $ | 49.60 | 90.08 |
| **Cumulative total hot metal production cost** | | | | **$308.15** |

| Converting & Casting Cost Summary | Converter & casting, external scrap 33.4% | USD/t (HM) | | USD/t (Steel) |
|---|---|---|---|---|
| | Scrap costs | | | $201.83 |
| | Consumables | | | 32.16 |
| | Labour & maintenance | | | 4.16 |
| | Casting | | | 8.00 |
| | Disposal cost | | | 1.10 |
| **Converting & casting production cost** | | | | **$247.26** |
| | Hot metal cost (sub-total) | $ | 308.15 | 232.96 |
| **Cumulative total steel billet production cost** | | | | **$480.22** |
| **Mining Costs** | | | | **$18.72** |
| **Cumulative Direct Operating Cost** | | | | **$498.94** |
| **Corporate Indirect Costs** | | | | **$3.30** |
| **Total Operating Cost** | | | | **$502.24** |

Table 7: Processing Operating Costs Summary Analysis

**General and Administration**

Annual cost for G&A was estimated at USD 1.6M and summarised

| Corporate Indirects | | USD |
|---|---|---|
| Total Site Management | USD/t (DRI) | 1.73 |
| Total Finance | USD/t (DRI) | 0.62 |
| Total HR and Administration | USD/t (DRI) | 0.14 |
| Total Purchasing and Logistics | USD/t (DRI) | 0.48 |
| Total HSE | USD/t (DRI) | 0.14 |
| Total Community and Government Relations | USD/t (DRI) | 0.14 |
| **Total** | **USD/t (DRI)** | **$3.25** |

Table 8: Annual cost for general and administration expenses

**Funding Alternatives:**

No formal funding discussions have commenced to achieve the range of outcomes indicated in the Study and funding of approximately USD557M will likely be required. Typical project development financing would involve a combination of debt and equity and Kogi has formed the view that there is a reasonable basis to believe that requisite future funding for development of the Agbaja Project will be available.

There are grounds on which this reasonable basis is established including the following positive project factors that would potentially assist secure project financing; or are being worked on during the feasibility studies including:

- Import substitution of steel product with sales proceeds in USD and ability to negotiate offtake agreements,
- Having strong EPCM contractors on a turnkey contract,
- Use of proven processing technologies,
- 100% owned iron ore raw material supply (JORC resource of 586mt @ 41.3% Fe) with required coal and limestone all within a 70 km radius,
- Completion during the Feasibility Study of the appropriate environmental study impact assessments; and
- Community agreements and full mining licenses being in place.

Based on the results of this Updated Scoping Study, the Company will actively pursue a review of debt funding, project finance, equity and export credit and offtake solutions for the Project as part of the final step of progressing towards a bankable Feasibility Study. Other financing options that will be considered include:

- The Company will also work with the Nigerian government on funding solutions and will seek government involvement in owning some of the capex infrastructure requirements;
- The Company would consider forming a strategic partnership and co-operation in the development of the Project with local Nigerian and African steel producers; and
- The Company could raise equity raising from traditional means and it would also approach new investors in the UK and Europe that have a strong understanding of funding African infrastructure projects.

**Investment Evaluation Summary**

The base-case Financial Model (BCFM) for the Agbaja Project assumes a 25-year project life with an annual steel billet production 500,000tpa and a steel billet price of $1,024/tonne from 2023 - 2032 (Fastmarkets) and then escalated using a forecast inflation rate (2.3% p.a. *US Inflation Forecast: 2021, 2022 and Long Term to 2030 Data and Charts – knoema.com*) from 2032 and using an 10% discount rate. These assumptions were selected by the Company as suitable estimates based upon conservative long-range forecasts.

A summary of the results of the cashflow modelling is presented in table 9

| Financial output | Initial 25 year operation |
|---|---|
| Revenue | USD 17,352M |
| Undiscounted Cumulative Net Cash Flow | USD 5,540M |
| Initial Capital Expenditure | USD 557M |
| Post-tax NPV (8% discount rate) | USD 1,399M |
| Post-tax IRR | 33% |
| Capital Payback Period | 4 years |

Table 9: Initial 25 Year Project Financial Economics

# Appendix 2

## Agbaja Updated Scoping Study

**Material Assumptions**

| Area | Comment |
|---|---|
| Study status | The Study has been prepared with an accuracy of +/- 30%. There is no certainty that the conclusions of the Study can be realised. |
| Mineral Resources underpinning the Study | The Agbaja Project Mineral Resource estimate that underpins the Study was released by the Company on 10 December 2013. It is available on the Company website. It was prepared by a competent person in accordance with the JORC Code 2012. There is no Ore Reserve at this date. The Updated Scoping Study is based on a combination of Indicated and Inferred Mineral Resources. Approximately 92% of the LOM production is in the Indicated Mineral Resource category and 8% is in the Inferred Mineral Resource category. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the conversion of Inferred Mineral Resources to Indicated or Measured Mineral Resources or that the production targets reported in this announcement will be realized.<br><br>The potential exploitation of the Agbaja mineral resource is extricable linked to the development of the integrated steel billet plant and viability of selling those steel billet products. The Company is undertaking a Feasibility Study to demonstrate such viability but there is no certainty that viability will be established. |
| Mining | Open pit truck and shovel operation with scrubber tails to be returned to the pit. Mining costs were estimated at USD 2.83/t of ore and waste moved based on tender submissions received in 2014 and escalated by CPI for the intervening 7 years. |
| Metallurgical factors or assumptions | The company has undertaken a number of metallurgical tests on the composition of the Agbaja iron ore. The company believe the samples tested were representative of the defined resource. The resource has been divided into two zones. This study has identified the mineralisation within these two zones.<br><br>The company has also undertaken a number of laboratory and pilot scale tests that provide confidence in the ability to produce commercial quality steel |
| Environmental | The Company has submitted an Environmental Impact Assessment (EIA) study to the regulatory authorities in Nigeria and has received approval on 5 January 2015 from the Nigerian Federal Minister of Environment in relation to proposed mining plan. The Company applied to extend the EIA to include the integrated steel billet plant. While the company is no aware of any impediments in this process, there is no certainty on this outcome |
| Infrastructure and Power | The Project is a greenfield project and as such will require new infrastructure to support the operation. Preliminary estimates have been included in the Tenova Capital estimates report 2021 that include, surface water infrastructure, access road, Workshops, Laboratories and a small accommodation camp. Due to recent supply chain constraints and rises in inflation, this 2021 Tenova CAPEX estimate has been increased by a factor of 10% to reflect recent feedback from equipment suppliers and constructors.<br><br>The company has undertaken a review of the available power supplies for the project. Given the vital nature of power in steel production the company has elected to control its own power generation. The Company has elected for combined cycle natural gas turbine power generation at the stage but will be reviewed as part of the Feasibility Study. The cost of power generation by this method is higher than buying Nigerian grid power, if it were available. Power is estimated at USD 0.1124/kwh. This has increased since 2021due to increased CAPEX estimates and increased fuel gas pricing quotations received. |
| Capital costs | The capital estimate is considered to have an accuracy of -30/+30%.<br><br>Major Capital expenditure items have been supplied by Tenova, FL Smidth and UHT. General Infrastructure and the building of the steel plant have utilised an uplift conversion factor based on a number of similar projects and relevant to the Nigerian environment. The Conversion rates have been supplied by Tenova. No separate contingency has been applied as contingency is inherently factored into the Conversion rate. All equipment has been assumed to be purchased new, as OEM systems. As such, opportunities may exist to reduce capital by sourcing reconditioned plant and equipment. Project build and installation will be undertaken utilising an EPCM contract. Estimate for EPCM were supplied by Tenova. |

| Area | Comment |
|---|---|
| Operating costs | Operating costs include all costs associated with mining, processing and general site administration. These costs were supplied following a review of operating cost completed by Tenova and released to the ASX on 2 September 2021 and as outline in the report have been updated as follows:<br><br>Mining: USD $19 / billet tonne<br>Steel Casting Processing & Support: USD $301 / billet tonne<br>Power Cost: USD $179 / billet tonne<br>General & Administration (G&A): USD $3 / billet tonne<br>Total Operating Cost: USD $502/ billet tonne |
| Revenue factors | Revenue analysis. Steel billet market data is not published for Nigeria. The Company commissioned and received two Market Feasibility Studies completed by Fastmarkets in June 2022 and January 2018. Steel billets produced are considered to be an import replacement product. Sales have been estimated on an import parity pricing basis based on information produced by Fastmarkets in the 2022 Market Feasibility Study. |
| Schedule and project timing | The next stage of project development is already underway with the present Feasibility Study under preparation. An integral part of the project will be securing the required capital with the Financial Investment Decision (FID) expected in 2023. Subject to that timeline, the project would be expected to commence in 2024-25. |
| Market assessment | Nigeria is the largest economy in Africa. Oil and Gas approximately accounts for two thirds of state revenue. Steel long products (and consequently billet demand) is driven by Nigerian construction demand. In 2022 the construction section represented 4% of the total Nigerian GDP. In 2022 Fastmarkets estimated that demand for steel billets for the Nigerian market to be in excess of the projected project production of 500,000 tonnes per annum. Billets in Nigeria are presently produced from scrap steel for the purposes of the Updated Scoping Study GDP is Inflation of 2.3% is based on data provided by Fastmarkets as part of the 2022 Market Feasibility study. The 2022 Fastmarkets study considered three scenarios for steel pricing and a forecast for scrap steel prices. This scoping study has utilised the base case scenario (mid point), refer to the ASX release on 20 June 2022. |
| Economic parameters | An after-tax nominal discount rate of 10% has been used for financial modelling. This number was selected as a generic discount rate appropriate for long life mining and steel projects.<br><br>Sales of steel billets from the integrated steel plant are planned to the Nigerian domestic market and as an import replacement. The sales of steel billets is reliant on the ultimate performance of the Nigerian economy. |
| Exchange rates | The Study revenues and costs were in USD. |
| Community and social responsibility | The Company has an approved community development agreement which is due for renewal in December 2021. The company has not identified any impediments in relation to its renewal but there is no certainty this will be achieved. The Company continues to consult with local communities, the general public and private interests. No significant environmental or stakeholder issues have been identified at this stage with strong support shown for the Project received from key stakeholders. |
| Permitting | The permitting of the Project from the federal, state and local governments has commenced. The environmental permit has been received for mining operations and extension to this permit is being sought to cover the steel plant. |
| Government | Fastmarkets as part of the 2018 market feasibility report assumed that a 5% billet import tariff would be introduced during the forecast period. The Company has removed that assumption from its financial model although it is noted that the import tariff may indeed be introduced at some time. The Company has not assumed any other financial assistance for the purposes of the Updated scoping study. It is likely however, that the ongoing strong relationship with the Nigerian government and further negotiations may lead to financial assistance in some form |
| Timeframe for Development | Kogi is completing a Feasibility Study in 2022-2023. Construction is targeted for 2024-2025. |

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## Glossary

**ASX** Australian Stock Exchange
**BOO** Build Own Operate
**cAPeX** Capital Expenditure
**cO2** Carbon Dioxide
**Dri** Direct Reduced Iron
**eAF** Electric Arc Furnace
**eIA** Environmental Impact Assessment
**ePcm** Engineer, Procure Construct and Manage contract
**Fe** Chemical Symbol for Iron
**FIS** FL Smidth - a consulting firm
**Fmenv** Federal Minister for the Environment
**FOb** Free on Board
**FS** Feasibility Study
**Irr** Internal Rate of Return
**JOrc** Joint Ore Reserves Committee
**Km** Kilometres
**Ktpa** thousand tonnes per annum
**lOm** Life of Mine
**m** Million
**mre** Mineral Resource Estimate
**mt** Metric Tonne
**mtpa** Million tonne per annum
**NPV** Net Present Value
**OPeX** Operating Cost
**P** Chemical Symbol for Phosphorous
**PFS** Pre-Feasibility Study
**rOm** Run of Mine
**Tpa** Tonne per annum
**UHT** Uvan Hagfors Teknology AB - consulting firm
**USD** USA Dollars
**W:O** Waste to Ore Ratio

KOGI IRON
LIMITED