

COMPANY OVERVIEW / KEY PROJECTS

Firebird Metals Ltd (ASX:FRB) is a mineral resource company based in Australia focused on the development of two key manganese projects to meet the growing demand of high purity manganese sulphate monohydrate (MnSO₄ or HPMSM) for Lithium Manganese Iron Phosphate (LMFP) batteries: a processing facility fed by Oakover concentrate and/or third-party manganese concentrate in China where resides both the expertise and most of the demand for HPMSM and a mine and treatment plant at Oakover in Australia to potentially complement the feed source of the processing facility and/or feed the alloys market.

KEY ELEMENTS OF STRATEGY

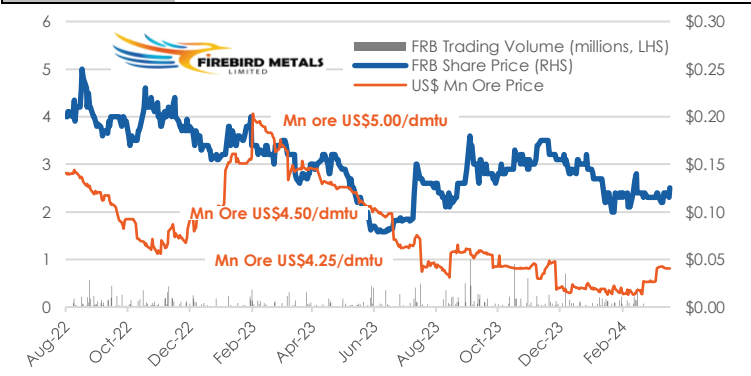
- The key elements of FRB strategy are as follows:
1. Develop a processing facility in China to meet the growing demand of a high purity manganese sulphate monohydrate (MnSO₄ or HPMSM) for LMFP batteries. The facility will be fed by Oakover concentrate and/or third-party manganese concentrate from overseas.
 2. LMFP is forecast to become the dominant cathode for EV batteries. Adding manganese to LFP batteries makes them safer, cheaper and provides more range.
 - o LMFP has a higher thermal run-away temperature than nickel-based batteries.
 - o LMFP are ~30% cheaper than nickel-based batteries. No expensive metals such as cobalt or nickel contained.
 - o LMFP energy density is 15-20% higher than LFP, due to Mn higher voltage.
 3. Progress development studies and permitting at the Oakover manganese project, Western Australia.

KEY OUTCOMES IF SUCCESSFUL

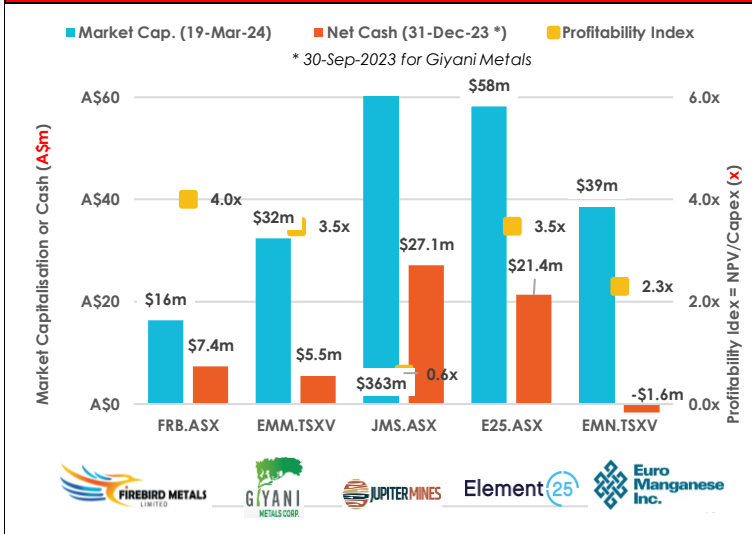
- ⇒ Significant player in the manganese market destined to LMFP batteries and EV manufacturers.
- ⇒ Supplier of the silica -manganese alloy market

CORPORATE OVERVIEW (AUD)

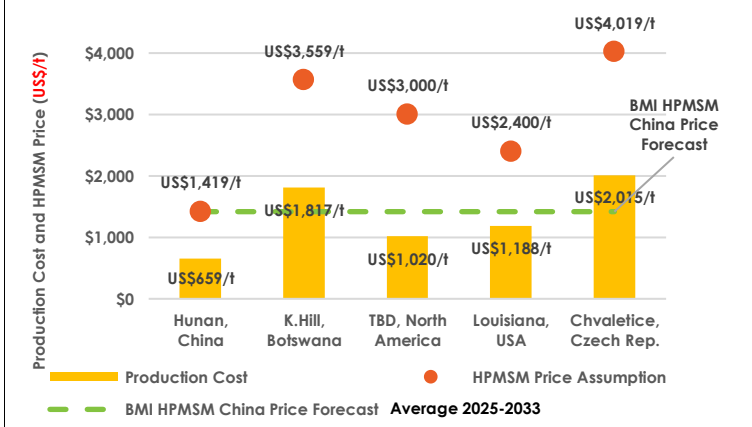
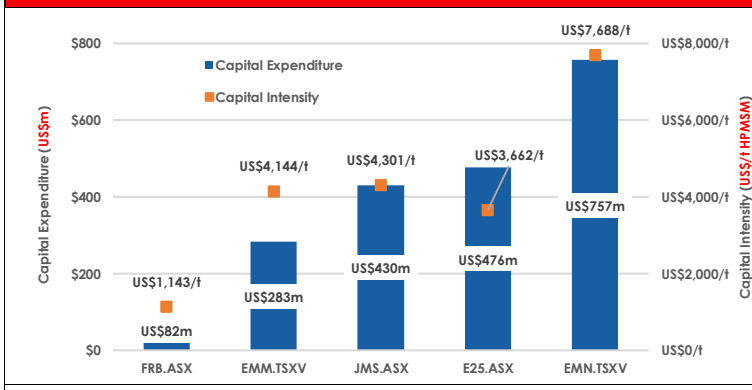
Shares	142.4 million ordinary fully paid shares
Options & Performance Rights	8.00m options @ \$0.30, expiring 18 Mar 2024 9.25m options @ \$0.30, expiring 2 Dec 2024 12.0m options @ \$1.00, exp. 30 Nov 2026 12.5m options @ \$0.30, exp. 6 Dec 2028 12.5m options @ \$0.40, exp. 6 Dec 2028 2.2m performance rights
Share Price	\$0.125 (as at 19 Mar 2024)
Market Cap.	\$17.8 million
Cash	\$7 million (as at 31 Dec 2023)
	⇒ Tight capital structure ⇒ Well-funded for 2024 development programs ⇒ Low enterprise value of only \$10.4 million



COMPARATIVE ANALYSIS



HUNAN HPMSM PROJECT BENCHMARKING

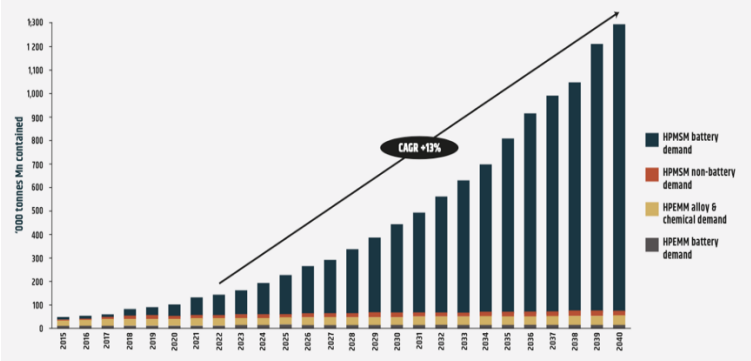


Compared to its peers, Firebird Metals and its Hunan High Purity Manganese Sulphate Monohydrate (HPMSM) project accumulate a number of enviable characteristics:

- Lowest capital expenditure
 - Lowest capital intensity
 - Life of project not limited by a mineral resource
 - Lowest operating cost
 - **Highest profitability index (NPV/Capex) with the**
 - **Lowest HPMSM price assumption**
 - Best expertise in Li-ion batteries and in particular LFP and LMFP batteries
 - Largest market at its doorstep
- ⇒ Firebird Metals is extremely well positioned to take advantage of the booming market for LMFP batteries.

MANGANESE USES in BATTERIES

Traditional Uses	<ul style="list-style-type: none"> Manganese has a long history of use as a cathode material for batteries in the form of Electrolytic Manganese Dioxide (EMD) and natural ore in the form of manganese dioxide MnO₂. Current production market sizes are 482,000 t in 2023 in China and 107,000 t for the rest of the world. ⇒ Proven benefit of Mn use in batteries ⇒ China by far dominates the market
Manganese Li-ion Batteries	<ul style="list-style-type: none"> Manganese is used in Li-ion batteries, including Nickel-Cobalt-Manganese (NCM), Lithium-Manganese Oxide (LMO) and Lithium-Manganese-Iron-Phosphate (LMFP) batteries. Due to its significant benefits, the use of LMFP cathode mix is set for massive growth. ⇒ Size and growth of LMFP market is potentially the largest in the medium to long term. ⇒ Manganese is abundant and relatively inexpensive compared to nickel and cobalt
Sodium-ion Batteries	<ul style="list-style-type: none"> Na-ion batteries have lower energy density. Na-ion batteries contain around 30% Mn. ⇒ Smaller market, but adding to the demand



LMFP FUTURE CATHODE FOR EV BATTERIES

Market Dominance	<ul style="list-style-type: none"> LFP batteries is currently the world's most used Li-ion cathode material for EV batteries. The three critical key considerations for battery manufacturers when assessing and developing a cathode mix is safety, cost and capacity: <ul style="list-style-type: none"> LMFP maintains LFP safety advantages over nickel-based batteries with a higher-thermal run-away temperature. LMFP is cheaper than LFP and 30% cheaper than nickel-based batteries. LMFP increased energy density by 15-20% Adding high purity manganese sulphate (MnSO₄) to LFP created LMFP, which delivers significant operational and safety benefits
Forecasts	<ul style="list-style-type: none"> Soochow Securities forecast LMFP will replace 50% of LFP batteries by 2030. Caitong Securities forecast blending LMFP with nickel-based batteries in China to reach 30% of all nickel-based cathodes being manufactured by 2030. Benchmark Mineral Intelligence estimate growth in HPMSM demand up to 5.3 mt by 2040. A massive increase from 135,000 tonnes in 2020.
Strategy	<ul style="list-style-type: none"> ⇒ Firebird LMFP battery strategy is perfectly timed. ⇒ Firebird is well-positioned to deliver HPMSM into this rapidly growing market

EV MANUFACTURERS using LMFP CATHODES



⇒ Some of the largest EV manufacturers are using LMFP batteries.

BATTERY GRADE MnSO₄ SCOPING STUDY

Location	<ul style="list-style-type: none"> Hunan province, China Key reagents such as sulfuric acid and steam in close proximity to the plant location Customers in Hunan province and surrounding provinces ⇒ Best expertise worldwide ⇒ Close to suppliers and customers ⇒ Largest LMFP, NCM and EV markets
Plant Capacity	<ul style="list-style-type: none"> 72,000 tonnes per annum of battery grade manganese sulphate equivalent producing: <ul style="list-style-type: none"> 50,000 tpa HPMSM 10,000 tpa Manganese Tetra Oxide (Mn₃O₄) ⇒ Affordable start-up size ⇒ Potential expansion through plant replication ⇒ Final product options according to market demand
Financials	<ul style="list-style-type: none"> HPMSM price assumption US\$1,419/t Capex US\$82.4 million Opex of US\$659/t NPV at 8% discount rate US\$331 million IRR 47% before tax Payback in less than 2 years Average annual EBITDA of US\$48.3 million ⇒ Low price assumption (see benchmarking) ⇒ Excellent operating margin (53%) ⇒ Relatively modest capex (see benchmarking) ⇒ Excellent profitability index (NPV/Capex of 4x)

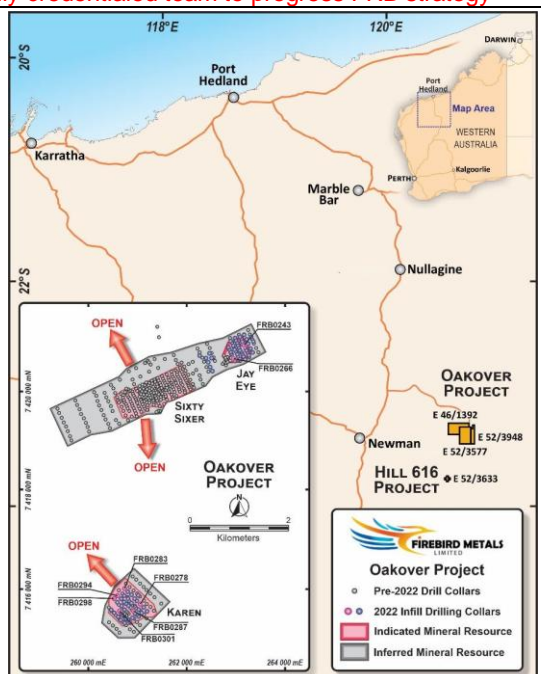
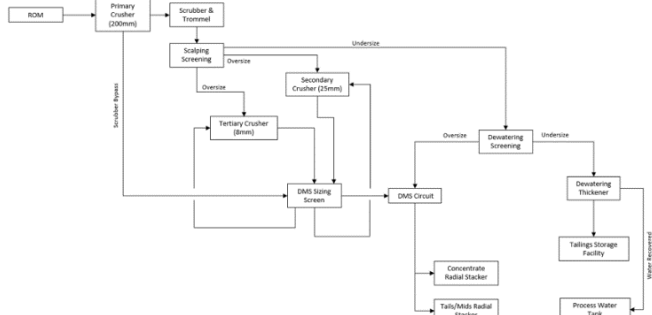
BATTERY GRADE MnSO₄ DEVELOPMENT

Expertise & Technology	<ul style="list-style-type: none"> Mr Zhou Qiyun, appointed COO Mr Zhou Qiyun has developed technology (some IP protected and already commercialised) to improve the end-product quality and the energy saving through the crystallisation process. ⇒ Best expertise worldwide
Site	<ul style="list-style-type: none"> Chinese subsidiary registered: Hunan Firebird Battery Technology Co Ltd Sulphate plant location selected in the Jinshi High Tech Industries Development Zone ⇒ Likely fast permitting process ⇒ Potential expansion through plant replication
Design	<ul style="list-style-type: none"> Advanced and commercialised crystallisation technology secured. Pilot plant designed and construction complete. Samples of MnSO₄ and Mn₃O₄ to be sent to potential customers and off-take parties. ⇒ On-going development momentum
Financing	<ul style="list-style-type: none"> On-going discussions with potential customers and off-takers as well as Chinese banks
Partner	<ul style="list-style-type: none"> Strategic cooperation agreement signed with China National Chemistry Southern Construction and Investment Co Ltd ⇒ Potential fast-tracked development

BOARD & MANAGEMENT

Evan Cranston - Chairman
Mr. Cranston is an experienced mining executive, with a background in corporate and mining law.
Peter Allen – Managing Director
Mr Allen is a mining executive with more than 20 years' experience in marketing manganese products, lithium and a range of other commodities.
Wei Li – Finance Director
Mr Li is a Chartered Accountant with extensive experience in the mineral resource industry. Mr Li managed a private base metals exploration company in the Northern Territory and assisted in the successful development of a A\$150 million Electrolytic Manganese Dioxide plant in Hunan, China. Mr Li mother tongue is Mandarin.
Ashley Pattison – Non-Executive Director
Mr Pattison has over 20 years' experience in the mineral resources sector from both a corporate finance and operational perspective.
Brett Grosvenor – Non-Executive Director
Mr Grosvenor is an experienced mining executive, with over 25 years' experience in the mining and energy industries.
⇒ Highly credentialed team to progress FRB strategy

- Life of mine 18 years
 - Conventional processing using ore sorting, crushing, scrubbing and Dense Media Separation (DMS) recovery
 - ~1.2 million tonnes per annum of 30-32% Mn concentrate
 - Capex A\$123 million
- ⇒ Project life is long enough to integrate renewable energies and battery storage into the energy mix and allowing up to 100% renewable power usage.
- ⇒ Low grade, bulk mining projects can deliver long life, low cost, low risk mining operations appreciated by majors and mid-caps or can be a company maker



OAKOVER MANGANESE ORE PROJECT

Location	<ul style="list-style-type: none"> • Western Australia • 600km from Port Hedland (world's largest bulk export port)
Geology	<ul style="list-style-type: none"> • Near-surface (mostly within 20m of surface), gently dipping (less than 10 degrees) to west south west • The manganese mineralisation occurs as multiple seams or bands of varying thickness within a highly weathered shale
Metallurgy	<ul style="list-style-type: none"> • Test work demonstrated 30-32% Mn concentrate product achievable • Hydrometallurgy test work demonstrated Battery Grade MnSO4 product achievable • anomalies that have not been drill tested to date.

MANGANESE MARKET

Production	<ul style="list-style-type: none"> ▪ South Africa, Australia, Brazil, Ghana and Gabon are major producing countries of global manganese ore. ▪ Manganese ore is predominantly mined in the form of carbonate, semi-carbonate or an oxide. ▪ Three manganese concentrate based on grade: <ul style="list-style-type: none"> ○ High grade >44% Mn ○ Medium grade between 30% and 44% Mn ○ Low grade <30% Mn
Consumption	<ul style="list-style-type: none"> ▪ China is the largest importer of manganese ore and concentrates and is also the largest producer of manganese alloys. According to International Manganese Institute, China imported more than ~30 million tonnes of manganese ore in 2022. ▪ Manganese ore is smelted into a manganese alloy, with the main types of manganese alloys being: <ul style="list-style-type: none"> ○ Silicomanganese (SiMn) – Most common alloy consumed and is used principally in the production of construction steels, such as long steels products like rebar. ○ High Carbon ferromanganese (HCFMn) – Used mainly in flat-steel products destined for manufacturing and consumer appliances. ○ Refined Alloys being Medium Carbon (MCFMn) and Low Carbon ferromanganese (LCFMn) – used mainly in higher-quality steels sector where impurities need to be closely controlled.
Market fit	<p>⇒ Oakover concentrate is expected to be very suitable as feed stock in the production of SiMn.</p> <p>⇒ SiMn is the largest manganese alloy market.</p>

Mineral Resource Estimate (March 2023, 7% Mn cut-off)						
Category	Tonnes	Mn	Fe	SiO2	Al2O3	P
Indicated	105.78	10.1	8.9	39.2	9.8	0.10
Inferred	70.87	9.6	8	36.5	9.5	0.09
Total	176.65	9.9	8.6	38.1	9.7	0.10
Concentrate Scoping Study (Aug. 2023)	<ul style="list-style-type: none"> • Mining inventory of 71.5 Mt (99.2% indicated) • Low mine strip ratio of 0.45:1 • Treatment plant capacity 4 mtpa 					

OTHER PROJECTS

Hill 616, Western Australia	<ul style="list-style-type: none"> ▪ 35km south of Oakover ▪ 57.5 Mt @ 12.2% Mn inferred Mineral Resource ▪ Similar Geology to Oakover
Wandanya, Western Australia	<ul style="list-style-type: none"> ▪ 50km SW of world class Woodie Woodie manganese mine ▪ Exploration focused. ▪ High-grade mineralisation with Direct Shipping Ore potential ▪ Rock chip results up to 65% Mn and 55% Mn