



# Australia's First LFP Battery Cathode Project

**International  
Mining and  
Resources  
Conference**

**2 November 2023**

ASX: AEV



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Information in this document relating to Exploration Results or estimates of Mineral Resources has been extracted from the reports listed below. The reports are available to be viewed on the company website at: [www.avenira.com](http://www.avenira.com)

27 September 2023: Mineral Resource Estimate of 66Mt @ 30% P2O5 to Support DSO Feasibility Study.

Avenira confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. Avenira 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. The information in this report that relates to Wonarah Mineral Resources has been compiled by Jonathon Abbot, a Competent Person who is a Member of the Australian Institute of Geoscientists.



# Disclaimer (con't)

## Cautionary and Forward-Looking Statements

### LFP Scoping Study

The LFP Scoping Study referred to in this presentation has been undertaken to determine the economic and technical feasibility of an LFP Plant constructed in Darwin, and to reach a decision to proceed following more feasibility studies. The Scoping Study has been prepared to an accuracy level of -30% to +40% accuracy.

The LFP Scoping Study is based on material assumptions outlined elsewhere in this presentation ("Study Parameters"). These include assumptions about the key commercial terms of potential offtake arrangements, future commodity prices, technology licencing arrangements, property leasing arrangements, etc. While Avenira considers all the material assumptions contained within the LFP Scoping Study to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes put forward by the LFP Scoping Study will be achieved. The Study Parameters have been disclosed to provide investors with an intended scale and nature of the Project.

The LFP Scoping Study referred to in this presentation has been undertaken to assess the technical and financial viability of the Project. Further evaluation work, including a Bankable Feasibility Study ("BFS") is required before Avenira will be able to provide any assurance of an economic development case. Avenira has concluded there is reasonable grounds for providing the forward-looking statements included within this presentation and that there is a reasonable basis to expect it will be able to fund the development of the LFP Project. Investors should not make any investment decisions based solely on the results of the LFP Scoping Study. While Avenira considers all of 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 this LFP Scoping Study will be achieved.

To achieve the range of outcomes indicated in the LFP Scoping Study, additional funding in the order of A\$180m and A\$527m for a 10,000tpa and 30,000tpa scale plant, respectively, will be required.

Investors should note that there is no certainty that Avenira will be able to raise funding when needed. It is possible that such funding may only be available on terms that dilute or otherwise affect the value of existing shares of Avenira. It is also possible that Avenira may pursue other value realisation strategies such as sale, partial sale, or joint venture of the project. If it does, this could materially reduce Avenira's proportionate ownership of the LFP Project.

The Company has concluded it has a reasonable basis for providing the forward-looking statements included in this presentation and believes that it has a reasonable basis to expect it will be able to fund the development of the LFP Project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the LFP Scoping Study.

This presentation contains certain financial measures relating to the LFP Scoping Study that are not recognized under International Financial Reporting Standards (IFRS). These metrics include (but are not limited to) Net Present Value (NPV), Internal Rate of Return (IRR) and EBITDA. Although the Company believes these measures provide useful information about the financial forecasts derived from the LFP Scoping Study, they should not be considered in isolation or as a substitute for measures of performance or cash flow prepared in accordance with IFRS. As these measures are not based on IFRS, they do not have standardised definitions and the way the Company calculates these measures may not be comparable to similarly titled measures used by other companies. Consequently, undue reliance should not be placed on these measures.



### DSO Feasibility Study

The DSO Feasibility Study referred to in this presentation has been undertaken to determine the economic and technical feasibility of a direct shipping project at the Wonarah mine site in the Northern Territory. The Feasibility Study has been prepared to an accuracy level of +/-10% to 15% accuracy.

The Feasibility Study is based on material assumptions outlined elsewhere in this presentation ("Study Parameters"). These include assumptions about the key commercial terms of potential offtake arrangements, future commodity prices, mining rates, crushing yields, operating costs etc. While Avenira considers all the material assumptions contained within the Feasibility Study to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes put forward by the Feasibility Study will be achieved. The Study Parameters have been disclosed to provide investors with an intended scale and nature of the Project. The Feasibility Study referred to in this presentation has been undertaken to assess the technical and financial viability of the Project.

Further evaluation work may be undertaken before Avenira is able to provide any assurance of an economic development case. Avenira has concluded there is reasonable grounds for providing the forward-looking statements included within this presentation and that there is a reasonable basis to expect it will be able to fund the development of the DSO Project. Investors should not make any investment decisions based solely on the results of the Feasibility Study. While Avenira considers all of 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 this Feasibility Study will be achieved.

To achieve the range of outcomes indicated in the Feasibility Study, additional funding in the order of A\$10 – 15 million will be required. Investors should note that there is no certainty that Avenira will be able to raise funding when needed. It is possible that such funding may only be available on terms that dilute or otherwise affect the value of existing shares of Avenira. It is also possible that Avenira may pursue other value realisation strategies such as sale, partial sale, or joint venture of the project. If it does, this could materially reduce Avenira's proportionate ownership of the DSO Project.

The Company has concluded it has a reasonable basis for providing the forward-looking statements included in this presentation and believes that it has a reasonable basis to expect it will be able to fund the development of the DSO Project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Feasibility Study.

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This presentation has been authorised for release by the Board of Avenira.



# Company Overview

Avenira is a fertiliser and battery cathode focused project developer, aiming to supply premium quality products into the electric vehicle, agricultural and industrial chemical markets.

By establishing a local, integrated supply chain, Avenira will sell critical high-value products into the **electric vehicle, agricultural and industrial chemical markets.**

Avenira is targeting the production and sale of **THREE** highly valuable product streams:

1. Direct Shipping (**DSO**) Phosphate, to supply into the fertilizer markets and for Yellow Phosphorus production;
2. LFP Cathode Active Material (**LFP**); and
3. Thermal Grade Phosphoric Acid (**TPA**).





# Corporate Snapshot

## Board of Directors



**Brett Clark**  
*Executive Chairman*

Engineer and Investment Banker with +30 years of Board and Senior Management/ Executive experience. Extensive exposure to financial/capital markets, project development and operations having previously worked in senior management and/or board roles with Rio Tinto, WMC Resources, Barrick Gold/ Antofagasta and Mitsubishi Development/ Murchison Metals JV in a variety of commodities including Iron, Gold, Copper, Coal, Graphite, Nickel, Cobalt, Potash and oil and gas.



**Kevin Dundo**  
*Non-Executive Director*

Experienced corporate lawyer with +20 years experience. Mr Dundo has project development experience as the former Chairman of Red 5 Limited



**Winnie Lai Hadad**  
*Non-Executive Director*

Australian qualified lawyer and a CPA. Established history of engagement between China based entities and Australian mining projects. Currently NED of Vonex Limited.



**Eddy Cheng**  
*Non-Executive Director*

An experienced senior management professional with established leadership credentials in the development of strategic outcomes. His background in business development, strategic analysis and negotiation provides a valuable addition.



**Roger Harris**  
*Non-Executive Director*

B App Science. Founding director / owner of a large service-based company with branches in Western Australia and SE Asia . Operates a family office for 30 years investing in the natural resources sector.

## Senior Management Team



**Steve Harrison**  
*Chief Geologist*

Mr Harrison has extensive experience across multiple commodities and varied parts of the geological "supply chain". Senior roles have been held within Newmont, BHP and MZI (now Doral). Steve completed a B.Sc. (Hons) at Curtin University and an MBA at UWA.



**Brian Campbell**  
*Project Director – DSO, LFP/TPA*

Mr Campbell has deep experience leading engineering teams specialising in phosphate projects for global engineering organisations. This included roles with Worley as Director Mined Fertilizers and as a Strategic Consultant and Thyssenkrupp.



## Capital Structure

Shares on issue (ASX:AEV)	1,730M
Listed Options	145M
Unlisted Options	160M
Top 20 Shareholders (30 June 2023)	~27.3%
Market Capitalisation (25 October 2023)	A\$22.5M
Market Capitalisation – Fully Diluted (25 October 23)	A\$26.5M
Cash (31 September 2023)	A\$1.4M
Debt (30 June 2023)	A\$3.5M

# Our Value Creation Strategy

Avenira is aiming to become one of the first world-scale LFP producers outside of China, Taiwan and Japan.



## DSO Project

- Feasibility Study completed <sup>1</sup>
- Mine Management Plan approved <sup>2</sup>
- Native Title Mining Agreement executed <sup>3</sup>
- Existing mining and transportation infrastructure available
- Offtake negotiations continuing to advance
- Advancing financing discussions

## Develop LFP Project

- Scoping Study completed <sup>4</sup>
- Binding License Agreement with Aleees <sup>5</sup>
- Advancing Feasibility Studies
- Advancing financing discussions

<sup>1</sup> **Note:** See Avenira ASX Announcement 19 October 2023.

<sup>2</sup> **Note:** See Avenira ASX Announcement 24 October 2023.

<sup>3</sup> **Note:** See Avenira ASX Announcement 3 July 2023.

<sup>4</sup> **Note:** See Avenira ASX Announcement 2 February 2023.

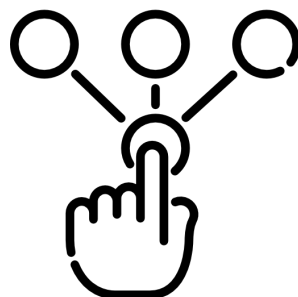
<sup>5</sup> **Note:** See Avenira ASX Announcement 26 September 2023.

<sup>6</sup> **Note:** Avenira intends to initially develop the LFP Plant as a standalone project, with feedstock (including TPA) secured from third party providers. The details of the phased capacity program should not be construed as production targets.

# Avenira's Value Proposition



One of Australia's Largest  
High-Grade Phosphate  
Mineral Deposits<sup>1</sup>



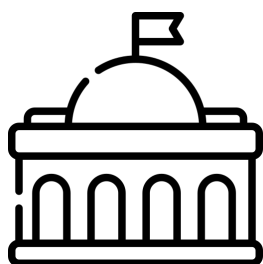
Optionality to build either TPA<sup>3</sup>,  
LFP or both plants to capitalise on  
the LFP battery or industrial market



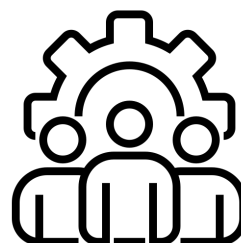
Close Proximity to Rail  
and Road Infrastructure



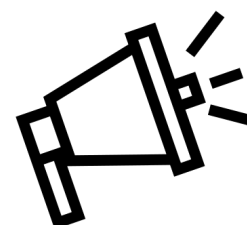
Competitive renewables  
(solar and wind) and gas  
pipeline



Strong Government<sup>2</sup>  
support to develop a  
Battery Supply Chain and  
Project in N.T.



Strong team of project  
development managers,  
advisors, and contractors



Strong pipeline of news  
flow expected over next  
12-18 months



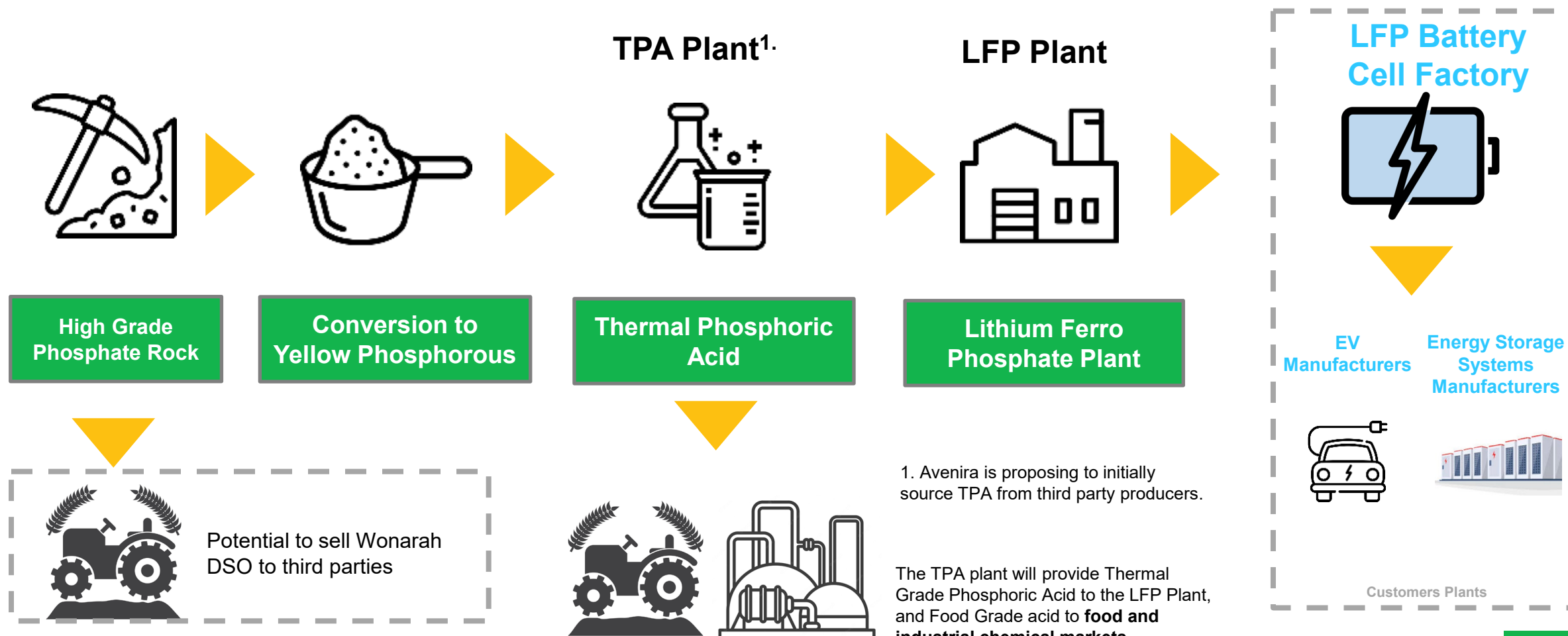
Primed to be a significant  
LFP producer globally  
with a derisked 4<sup>th</sup> Aleees  
technology plant.

<sup>1</sup> See Avenira ASX Announcement 14 October 2022  
<sup>2</sup> See Avenira ASX Announcement 23 September 2022

<sup>3</sup> **Note:** Avenira intends to initially develop the LFP Plant as a standalone project, with feedstock (including TPA) secured from third party providers and further work is required to determine whether there is a reasonable basis for AEV to expect it can extract commercially sufficient high grade phosphorous from the Wonarah project for the LFP plant.

# Project Integration Pathway

Avenira's Wonarah Project can<sup>1</sup> supply a steady source of high-grade Phosphorous, an essential precursor for LFP Battery Cathodes and a high value input into agriculture



<sup>1</sup> Note: Avenira intends to initially develop the LFP Plant as a standalone project, with feedstock (including TPA) secured from third party providers.





## Wonarah DSO Project

# Highlights: DSO Feasibility Study <sup>1</sup>

Avenira is pursuing a low Capex, fast-track, DSO Project at Wonarah to capitalise on the global shortage for premium grade phosphate rock



## Wonarah Phosphate Deposit

- One of Australia's largest undeveloped high-grade Phosphate Resources with 66Mt @ 30% P<sub>2</sub>O<sub>5</sub> <sup>2</sup>
- Operations will focus exclusively on the Arruwurra deposit over 23-months<sup>3</sup>, with opportunities to extend



## Simple Process Flowsheet

- Low technical risk, simple open-pit mining and crushing operation, requiring no chemical beneficiating
- Mined DSO will be crushed and screened to produce three distinct saleable phosphate rock products



## Robust Project Economics

- Low pre-production Capex of A\$11.5 million enables short-payback period of 14-months
- Total free cash flows generated of A\$27.3 million, leveraging the demand-supply shortfall for phosphorus



## Cash Flow to Support Downstream Developments

- Cash flows to be earmarked to support the development of Avenira's other downstream ventures
- Opportunities to integrate feedstock from Wonarah



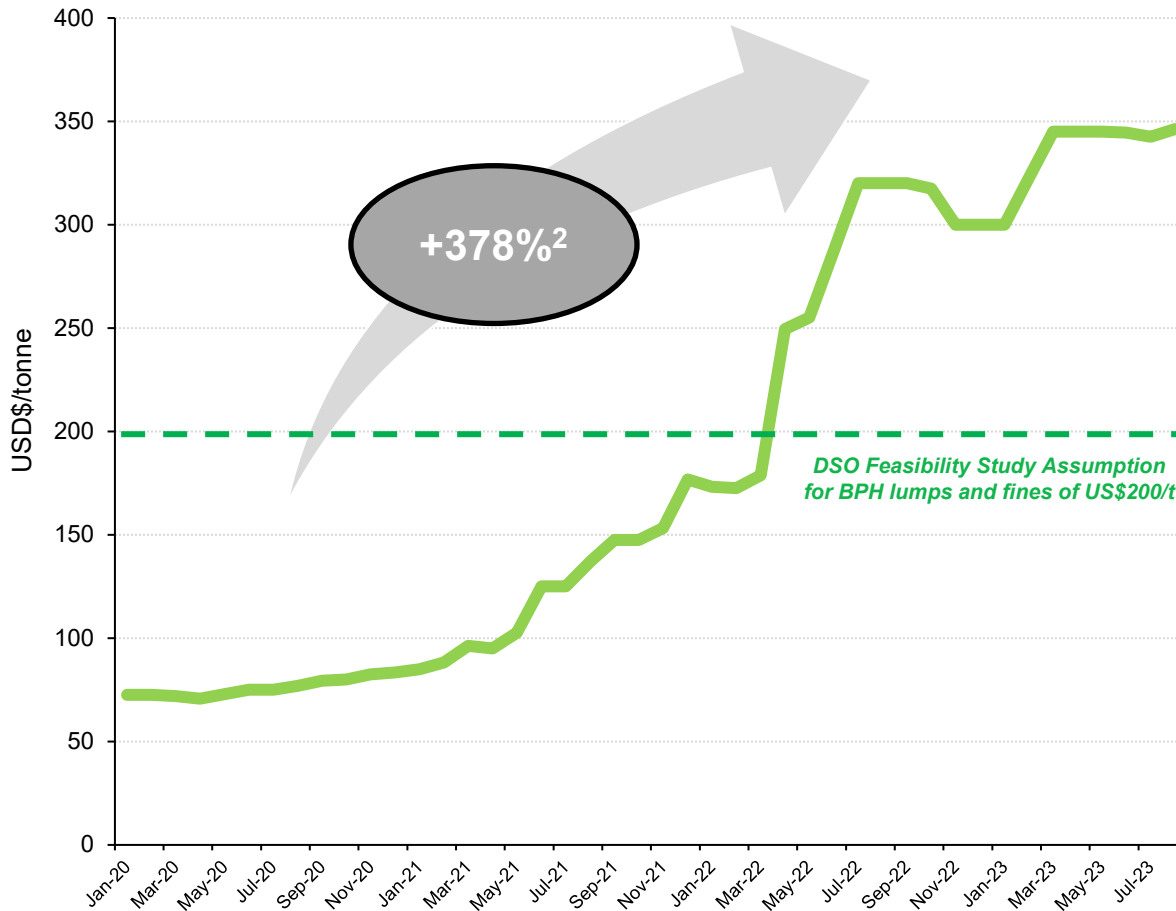
<sup>1</sup> Note: See Avenira ASX Announcement 26 October 2023.

<sup>2</sup> Note: See Avenira ASX Announcement 27 September 2023.

<sup>3</sup> Note: Including mobilisation and pre-production developments at Wonarah.

# Demand-Supply Shortfall for Phosphorus

## Morocco FOB Benchmark Price, 32% P<sub>2</sub>O<sub>5</sub><sup>1</sup>



- ❑ Phosphorous is an essential plant nutrient, with 85% of all phosphate rock produced globally used to make fertilisers
- ❑ Growing human populations and expanding meat consumption in developing countries have continued to outpace new supply
- ❑ Geopolitical factors have provided additional tailwinds, which have seen benchmark prices increase significantly over the past year
  - ❑ Russian exports falling following the invasion of Ukraine
  - ❑ China suspending exports to preserve domestic supply
  - ❑ EU heavy metal limits restricting supply from Morocco

*Avenira anticipates prices to continue to rise over the medium to long term driven by the rapid adoption of LFP batteries and the increasing demand for Thermal Phosphoric Acid (TPA)*

<sup>1</sup> Source: Data from the World Bank Pink Sheet, <https://www.worldbank.org/en/research/commodity-markets>

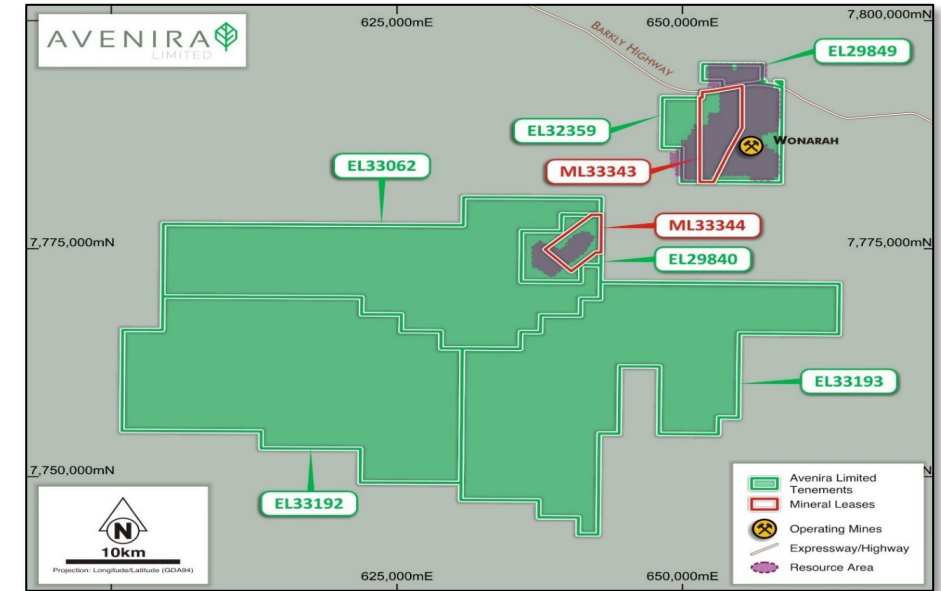
<sup>2</sup> Note: Morocco benchmark has increased from US\$72.5/t to US\$346.3/t from 2020 to 2023.



# Wonarah Deposit and Mineral Resource

Wonarah is one of the largest undeveloped high-grade phosphate rock resources in Australia, with 66Mt at 30%  $P_2O_5$  <sup>1</sup>

- ❑ Wonarah deposit is located within the Georgina Basin, a sedimentary basin ~260km East of Tennant Creek and ~960km Southeast of Darwin
- ❑ Accessible via the Barkly Highway on a priority bitumen sealed road between Tennant Creek to the West and Mount Isa to the East
- ❑ Located on enhanced Aboriginal Freehold Land owned by the Arruwurra Aboriginal Corporation (**AAC**)
- ❑ Mineralised domains includes two orebodies: Arruwurra and Main Zone. Arruwurra contains a primary phosphate unit (**APH**) and a basal indurated high-grade phosphate unit (**BPH**)
- ❑ Wonarah is supported by existing regional infrastructure:
  - Arruwurra campsite and facilities
  - Tennant Creek railway, with spare freight capacity
  - Natural gas pipeline adjacent to Avenira's tenements
  - Port of Darwin, an established bulk commodities port



	Category	Million Tonne	$P_2O_5$ %
Mineral Resources 27% $P_2O_5$ cut-off	Measured	3.4	30.9
	Indicated	9.6	30.0
	Inferred	53	30
	<b>Total</b>	<b>66</b>	<b>30</b>
Mineral Resources 15% $P_2O_5$ cut-off	Measured	64.9	22.4
	Indicated	133	21.1
	Inferred	352	21
	<b>Total</b>	<b>533</b>	<b>21</b>

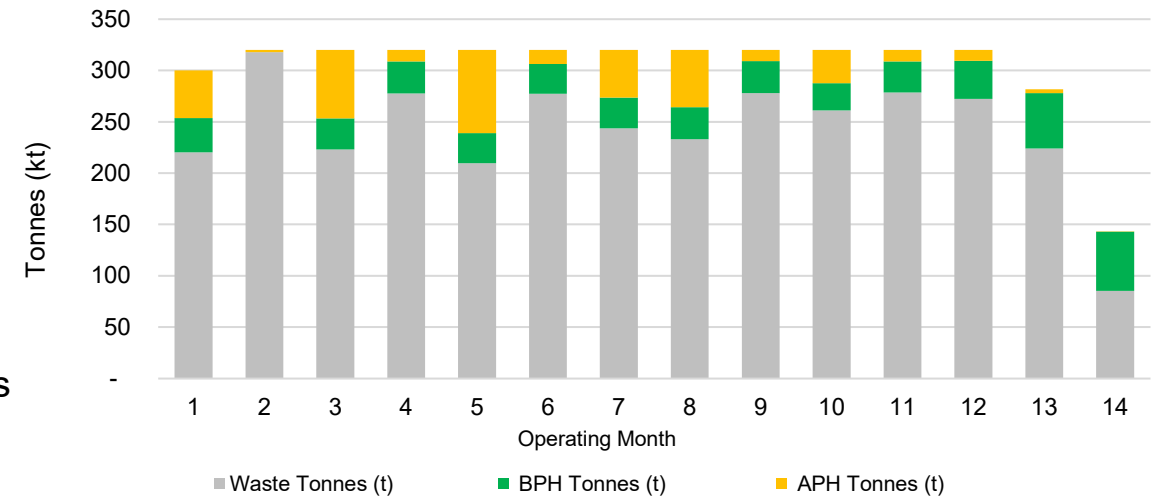
<sup>1</sup> Note: See Avenira ASX Announcement 27 September 2023.

# Mining Operation

Simple conventional open pit truck and excavator mining, with progressive stripping and limited drill and blast operations

- ❑ Mining will focus exclusively on the Arruwurra deposit
- ❑ 14-month mine plan, with opportunities to extend
- ❑ Single open-pit mine to be developed across five pit stages
- ❑ Schedule based on Measured (89%) and Indicated (11%) Resources
- ❑ Low strip ratio of 4:1 (including APH and BPH run-of-mine)
- ❑ Mining contractors will be utilised to ensure capital efficiency
- ❑ Mining will produce two distinct materials
  - a robust high-grade (32.8%  $P_2O_5$ ) **BPH material**
  - a lower-grade (19.9%  $P_2O_5$ ) **APH material**

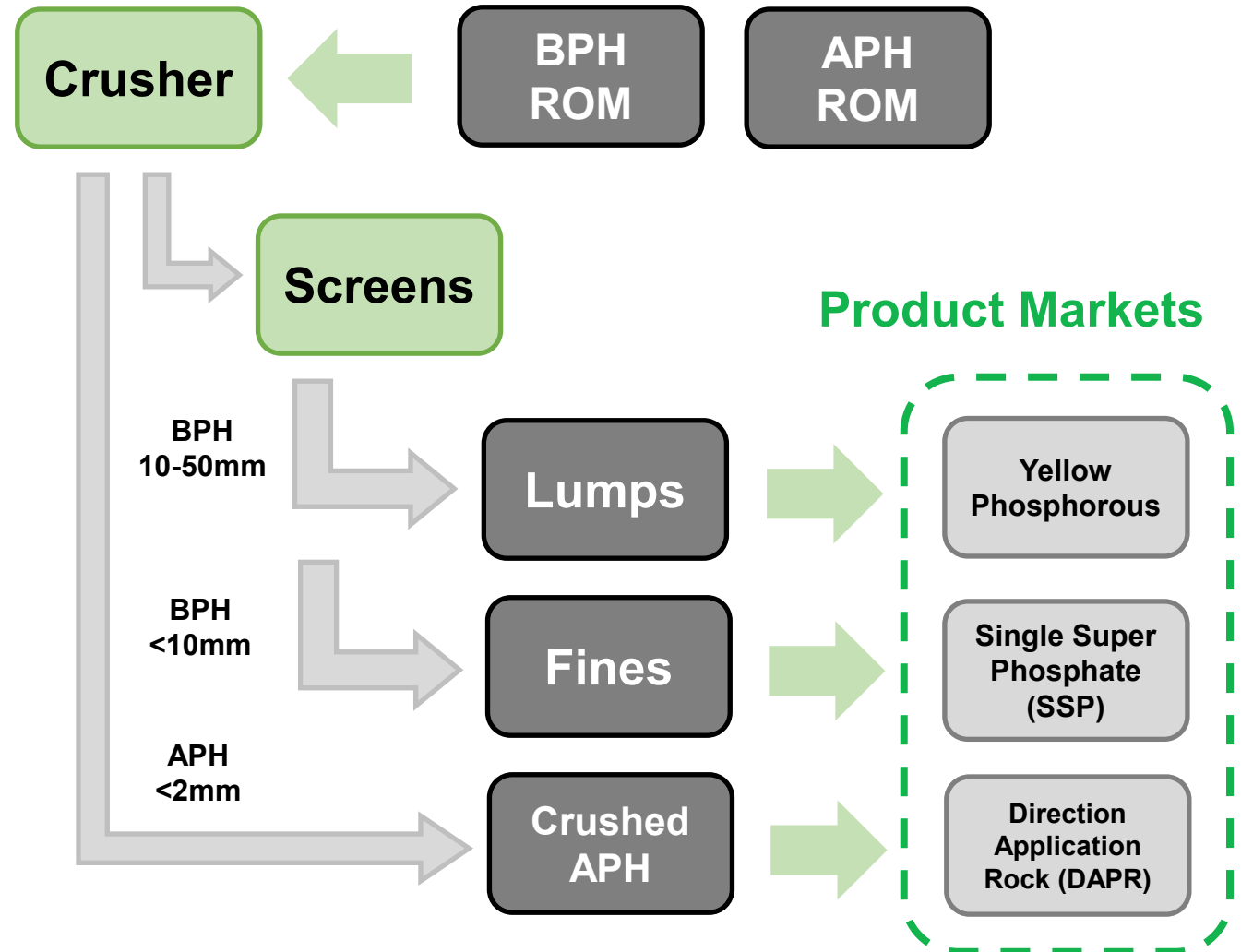
Mining Rate by Material Type



# Crushing and Treatment Process

Mined DSO will be crushed and screened via an onsite crushing plant, producing three phosphate products each with distinct target markets

- ❑ Simple mobile crushing and screening plant
- ❑ Mined BPH to be crushed, with screens to divert fines below 10mm and lumps above 50mm
- ❑ Both the lumps (10-50mm) and fines (<10mm) will be loaded onto shipping containers for regional export
- ❑ APH feed to be crushed and screened to below 2mm
- ❑ Plant will be optimised to maintain a steady production rate and meet shipping requirements of 25kt per month





# Logistics and Product Haulage



**BPH lumps and fines will be transported from the Wonarah mine site to Darwin Port; APH will be sold directly at mine gate**

- ❑ **Road Haulage to Tennant Creek:** BPH Lumps and Fines will be loaded into containers and trucked to Tennant Creek along the Barkly Highway
- ❑ **Rail Haulage to Darwin Port:** Containers will then be conveyed to Darwin East Arm Port via the railway line
- ❑ **Stevedoring:** Containers will be unloaded into a stockpile at Darwin Port prior to loading onto bulk cargo ships for regional export



## Total Haulage Distance:

- **30km** access road from mine stockpile to Barkly Highway
- **284km** on the Barkly Highway to Tennant Creek
- **875km** on the Adelaide to Darwin rail-line to Darwin Port

# Target Markets, Products and Prices

## BPH Lump

- BPH lumps will be targeted to regional offtakers in Southeast Asia for the manufacture of Yellow Phosphorus
- Yellow Phosphorus is a synthetic material used to produce Thermal Phosphoric Acid, and ultimately LFP cathode
- BPH is uniquely well suited for this process due to its:
  - high  $P_2O_5$  grade and silica content
  - physical robustness and large lump size parameters

## BPH Fines

- BPH fines will be exported overseas to produce Single Super Phosphate (**SSP**)
- SSP is a low-cost fertiliser used to promote soil fertility
- BPH allows unique blending opportunities with other phosphate rocks that have a lower  $P_2O_5$  content

## APH DAPR

- Crushed APH will be sold at mine gate to local traders and farmers and will be directed to agriculture in the NT
- DAPR is dissolved in soils, slowly releasing phosphorus
- Bioavailable phosphate is price competitive with manufactured phosphate in certain isolated regions due to their distance from the port



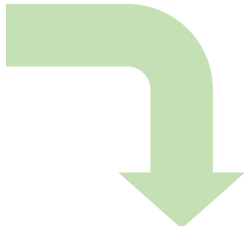
Feasibility Study Price Assumptions	USD\$/tonne	AUD\$/tonne <sup>1</sup>
<b>BPH Lump</b> (32.8% $P_2O_5$ ): 10-50mm (FOB)	200	308
<b>BPH Fines</b> (32.8% $P_2O_5$ ): <10mm (FOB)	200	308
<b>APH DAPR</b> (19.9% $P_2O_5$ ) (Mine Gate)	65	100

<sup>1</sup> Note: Conversion based on AUD/USD exchange rate of 0.65

# DSO Project Key Results

Low capital requirements coupled with the strong tailwinds that have driven phosphate rock prices to near-record highs are expected to enable a rapid 14-month payback period and healthy cash flows of A\$27.3 million <sup>1</sup>

Production Physicals			Financial Outcomes		
Lump Sales	Fines Sales	DAPR Sales	Total Free Cashflow	Capex	Payback Period
180kt	271kt	225kt	\$27.3M	\$11.5M	14
Total Sales	Total Sales	Total Sales	Undiscounted Free Cashflow	Pre-Production Requirements	Months
BPH Grade	APH Grade	Operations	Total Revenue	Weighted Price	AISC
32.8%	19.9%	23	\$161.3M	\$238.6/t	\$181.3/t
P <sub>2</sub> O <sub>5</sub>	P <sub>2</sub> O <sub>5</sub> %	Months	Real \$	A\$ / Tonne	A\$ / Tonne



Total free cash flows are **121%** of Avenira's market capitalisation <sup>2</sup>

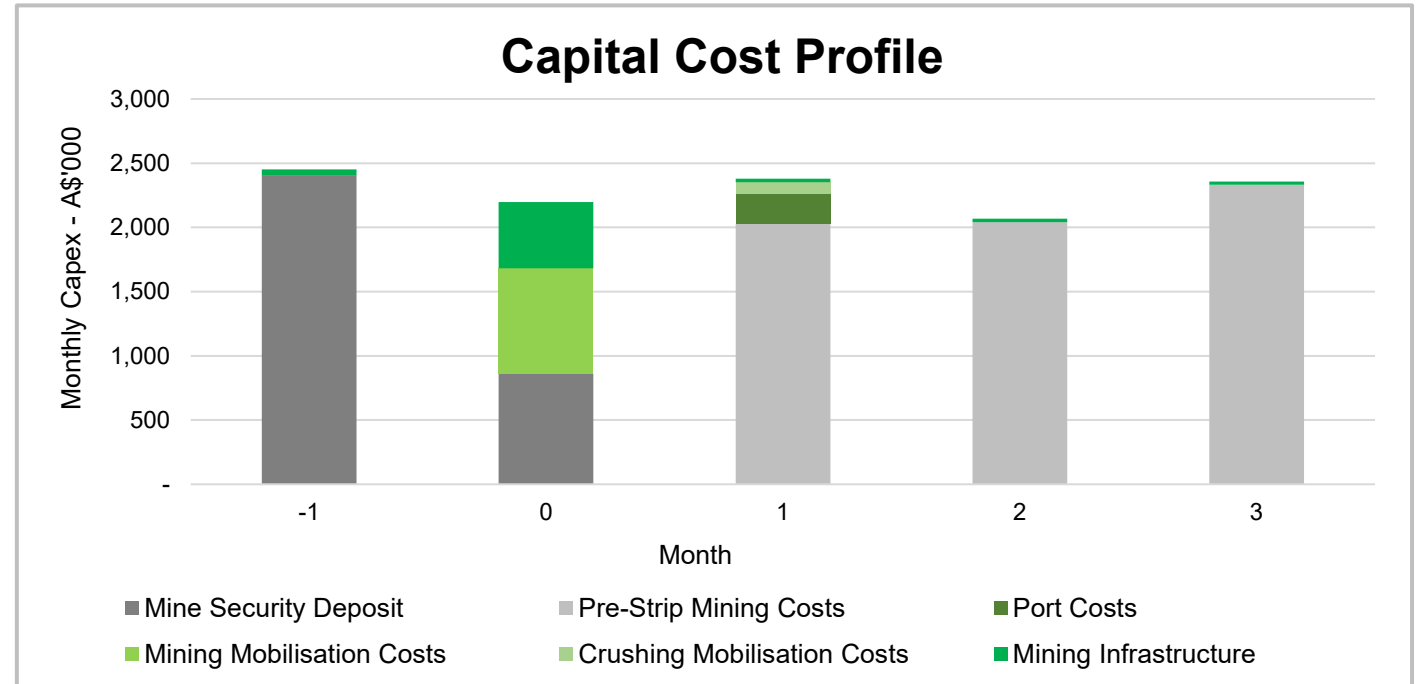
<sup>1</sup> Note: Information presented is based on the Feasibility Study for the Wonarah DSO Project, dated 19 October 2023.

<sup>2</sup> Note: Based on Avenira's market capitalisation on 25 October 2023 of A\$22.5 million.



# DSO Project - Capital Expenditure

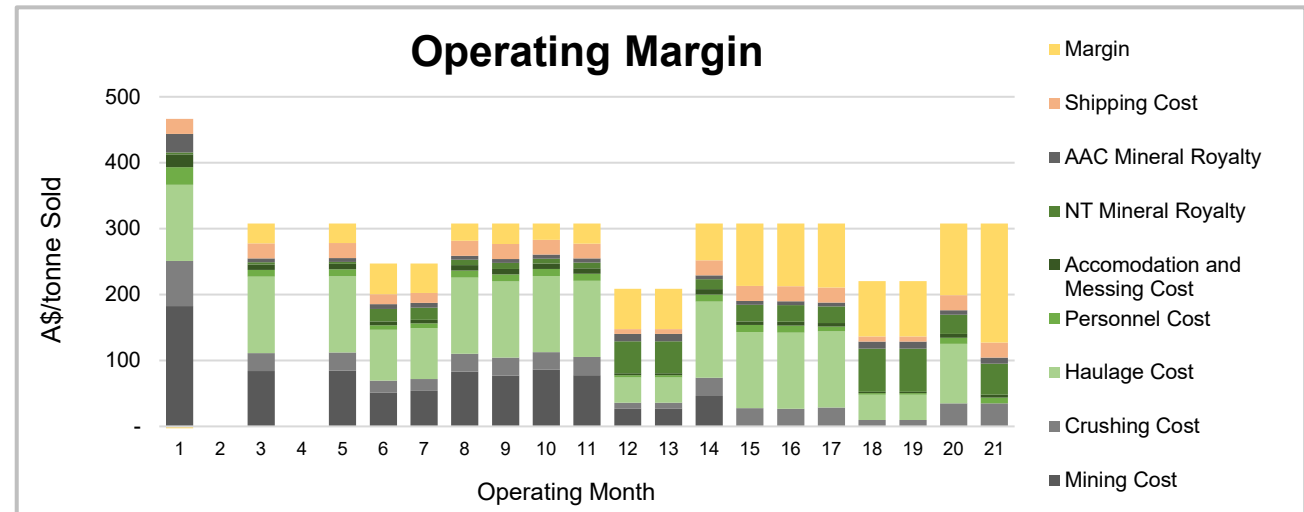
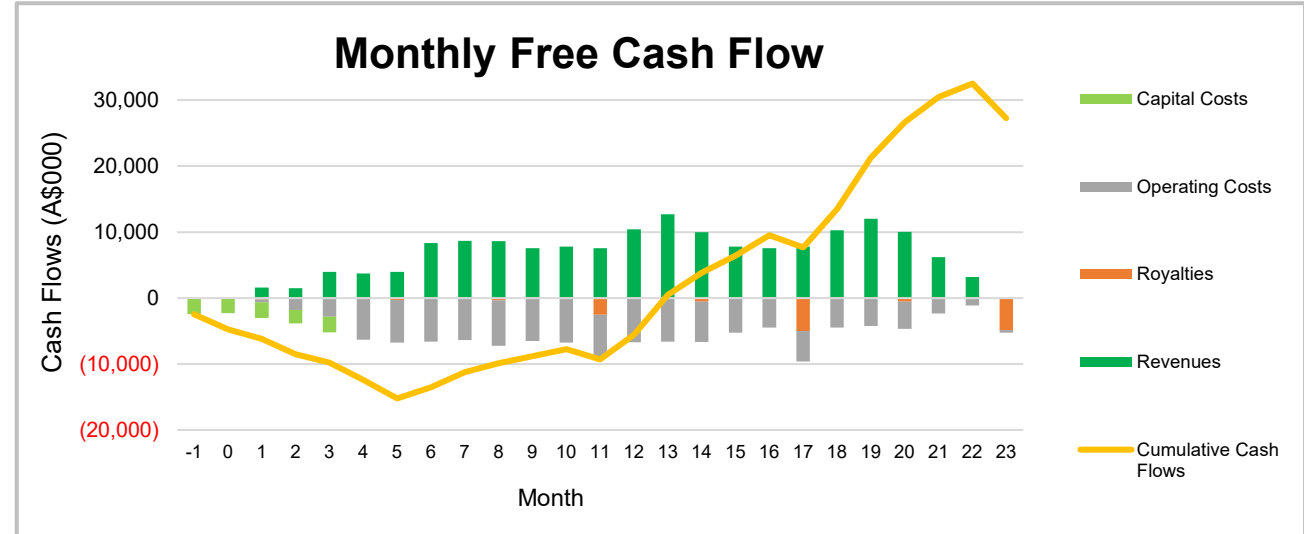
Capital Investment (Real \$)	A\$M	%
Mine Security Deposit	2.9	25.7
Pre-Strip Mining Costs	5.8	50.3
Port Costs	0.2	1.8
Mining Mobilisation	0.7	6.4
Crushing Mobilisation	0.1	0.7
Mining Infrastructure	0.6	5.1
Contingencies	1.1	10.0
<b>Total Capex</b>	<b>11.5</b>	<b>100.0</b>



- ❑ Total Capex is expected to be incurred evenly over the course of 5 months, with 2 months of capital outlay for mobilisation and site preparation
- ❑ Largest component of Capex is pre-strip mining (50.3%)
- ❑ Avenira intends to finance the capital requirements from a combination of debt and equity capital markets

# DSO Project - Operating Costs and Free Cash Flow

Operating Costs per tonne sold (Real \$)	A\$M	A\$/BPH Lump Tonne	A\$/BPH Fines Tonne	A\$/APH DAPR Tonne	A\$/Average Product Tonne
Mining (ex. pre-strip)	21.2	30.2	30.2	33.7	<b>31.3</b>
Crushing	14.5	16.9	16.9	30.5	<b>21.5</b>
Haulage	52.2	115.7	115.7	-	<b>77.2</b>
Shipping	10.3	22.8	22.8	-	<b>15.2</b>
Personnel	5.5	8.2	8.2	8.2	<b>8.2</b>
Accom. and Messing	3.9	5.7	5.7	5.7	<b>5.7</b>
Demobilisation	0.5	0.7	0.7	0.7	<b>0.7</b>
<b>C1 Cash Costs</b>	<b>108.0</b>	<b>200.2</b>	<b>200.2</b>	<b>78.8</b>	<b>159.8</b>
NT Royalties	11.4	-	-	-	<b>16.8</b>
AAC Royalties	3.1	-	-	-	<b>4.6</b>
<b>AISC Cash Costs</b>	<b>122.5</b>	-	-	-	<b>181.3</b>



# DSO Project - Milestones and Next Steps

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Negotiation and execution of **Native Title Mining Agreement** with Arruwurra (AAC) complete <sup>1</sup>



**Feasibility Study** complete, confirming the financial and technical viability of the DSO Project <sup>2</sup>



Authorisation received from the Northern Territory Government for the **Mine Management Plan** <sup>3</sup>



**Offtake** negotiations progressing with regional parties <sup>4</sup>



Secure **Funding** for the DSO Projects capital requirements

<sup>1</sup> **Note:** See Avenira ASX Announcement 3 July 2023

<sup>2</sup> **Note:** See Avenira ASX Announcement 19 October 2023

<sup>3</sup> **Note:** See Avenira ASX Announcement 24 October 2023

<sup>4</sup> **Note:** While discussions on potential offtake are progressing well, there is no assurance that these discussions will result in a binding offtake agreement.







## LFP Project

# What is LFP Cathode Active Material?

Cathode Active Materials (CAM) are high purity chemicals that distinguish the application and output of different types of Lithium-ion batteries



LFP Cathode Active Material Powder



and



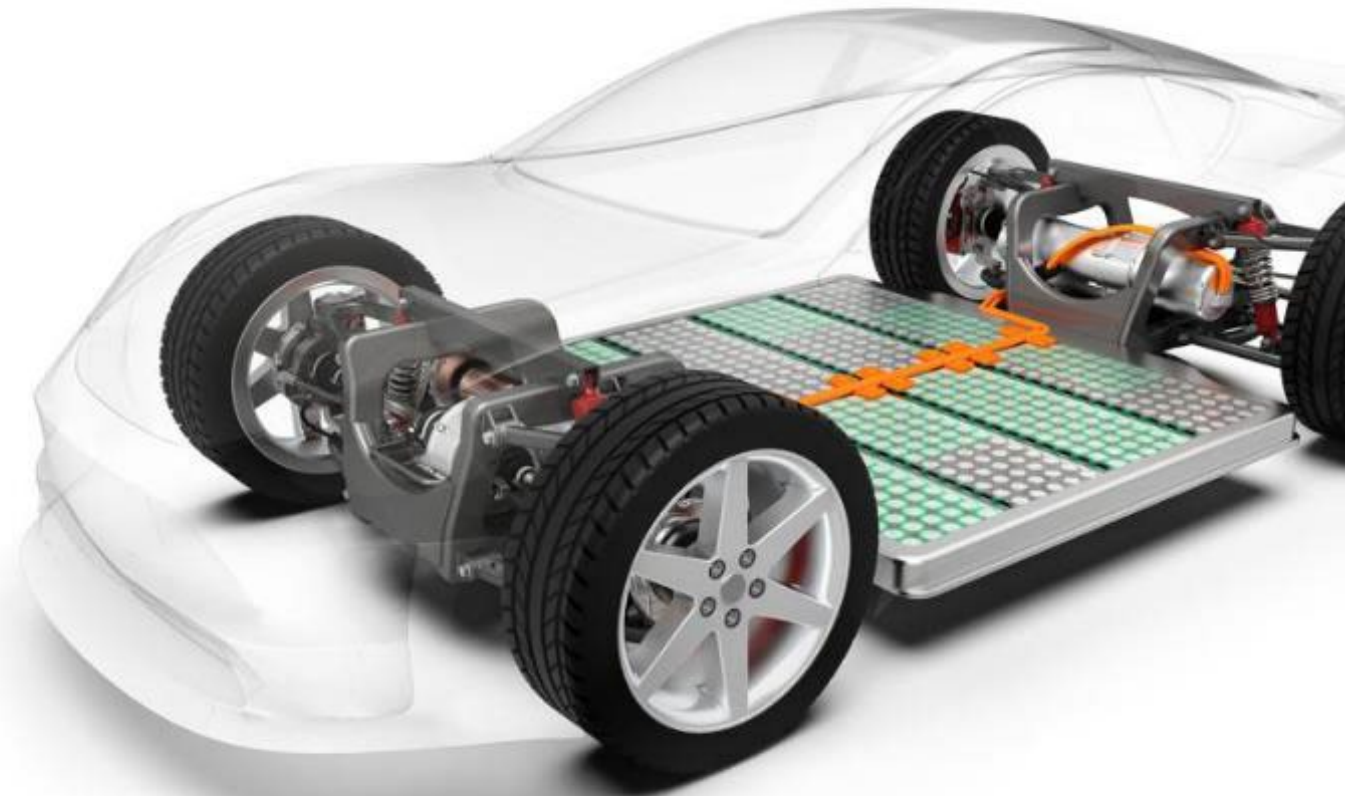
- ❑ Battery cell manufacturers are currently facing **unprecedented demand for Lithium-ion batteries**, with demand expected to grow exponentially over the next decade<sup>1</sup>
- ❑ **Cathode active materials within electric batteries** determine the cost, durability, safety, efficiency and **overall performance of Lithium-ion batteries**
- ❑ Over the next decade two types of cathode active materials are expected to dominate the electric vehicle and renewable energy storage markets:
  - ❑ Lower priced density, **LFP CAM**
  - ❑ Higher energy density, **NCM CAM**
- ❑ In August 2022, **UBS raised its outlook for LFP share of the global battery cathode market to 40% by 2030<sup>1</sup>**

<sup>1</sup> Source: S&P Global: Commodity Insights, "UBS raises LFP global battery market share outlook to 40% by 2030" dated 16<sup>th</sup> Aug-22

# Emergence of LFP Batteries

**LFP is rapidly growing as the battery chemistry of choice for electric vehicles and stationary storage**

- ✓ **Lower Cost:** low cost, surging nickel and cobalt prices
- ✓ **Safety:** safe, low toxicity and thermal stability, no fires
- ✓ **Reliability:** well-defined performance, longer life cycle
- ✓ **Performance:** long-term performance stability, higher discharge rate
- ✓ **Faster Charge:** cycle life for LFP batteries is significantly higher than other lithium ion batteries
- ✓ **Light Weight:** superior power-to-weight ratio, smaller battery packs
- ✓ **Ethically Sourced:** does not contain conflict metals, such as Cobalt
- ✓ **Recyclable:** Nickel and Cobalt-free, recycling friendly
- ✓ **Less Maintenance:** no memory effect from incomplete discharge before re-charging

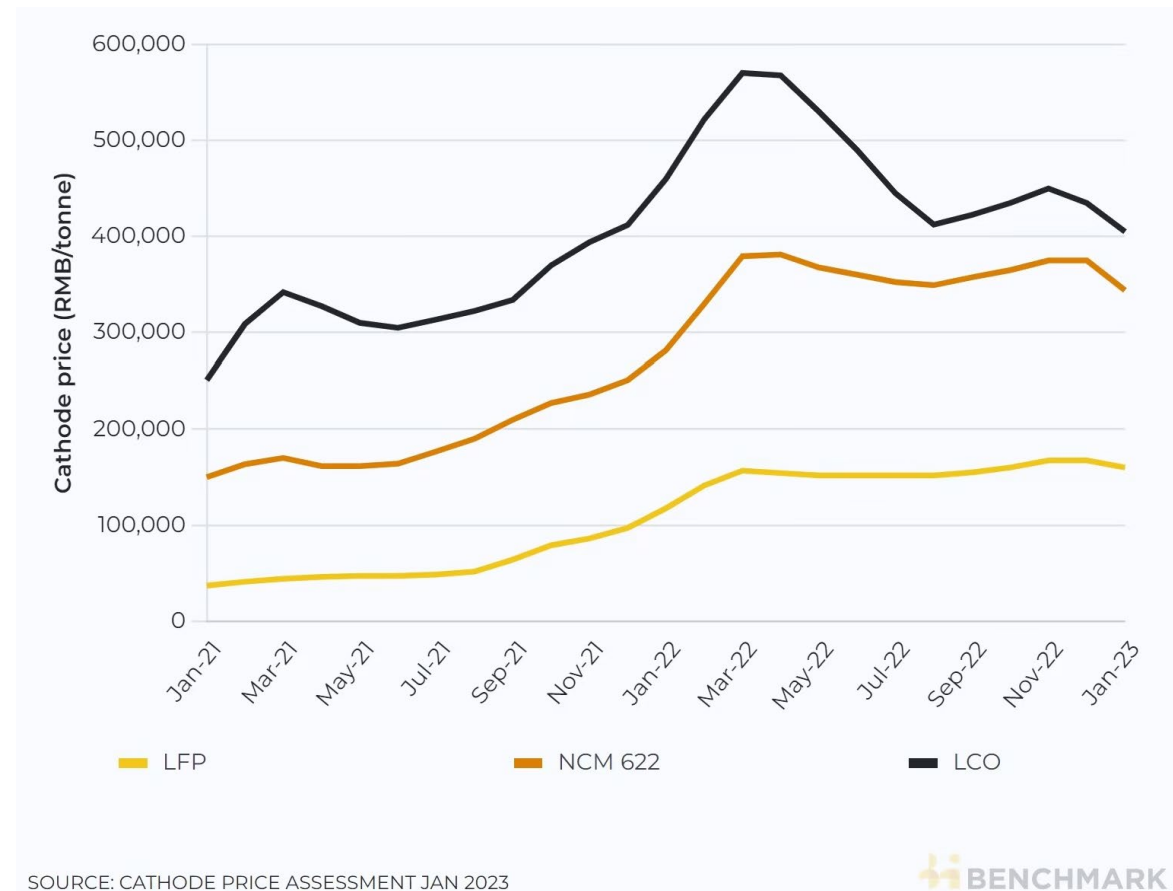




# Market Shift in Preferred Chemistries

**Superior cost structure, safety characteristics and an improving driving range are the key factors propelling the markets rapid adoption of LFP, displacing other battery chemistries**

- ❑ LFP is the cheapest cathode chemistry at around RMB 160,000 (US\$23,840) per tonne of material.
  - Compared to between RMB 335,000 (US\$49,915) and RMB 385,000 (US\$57,365) per tonne for NCM chemistries and RMB 405,000 (US\$60,050) per tonne for LCO, according to Benchmark<sup>1</sup>.
- ❑ LFP cathodes are expected to make up around 48% of all cathode demand (in tonnes) in 2023, according to Benchmark's cathode forecast, up from 41% in 2022 due to rising use of the chemistry in China<sup>1</sup>.



SOURCE: CATHODE PRICE ASSESSMENT JAN 2023

Source: Benchmark Mineral Intelligence, "Benchmark Source" 1 February 2023

BENCHMARK

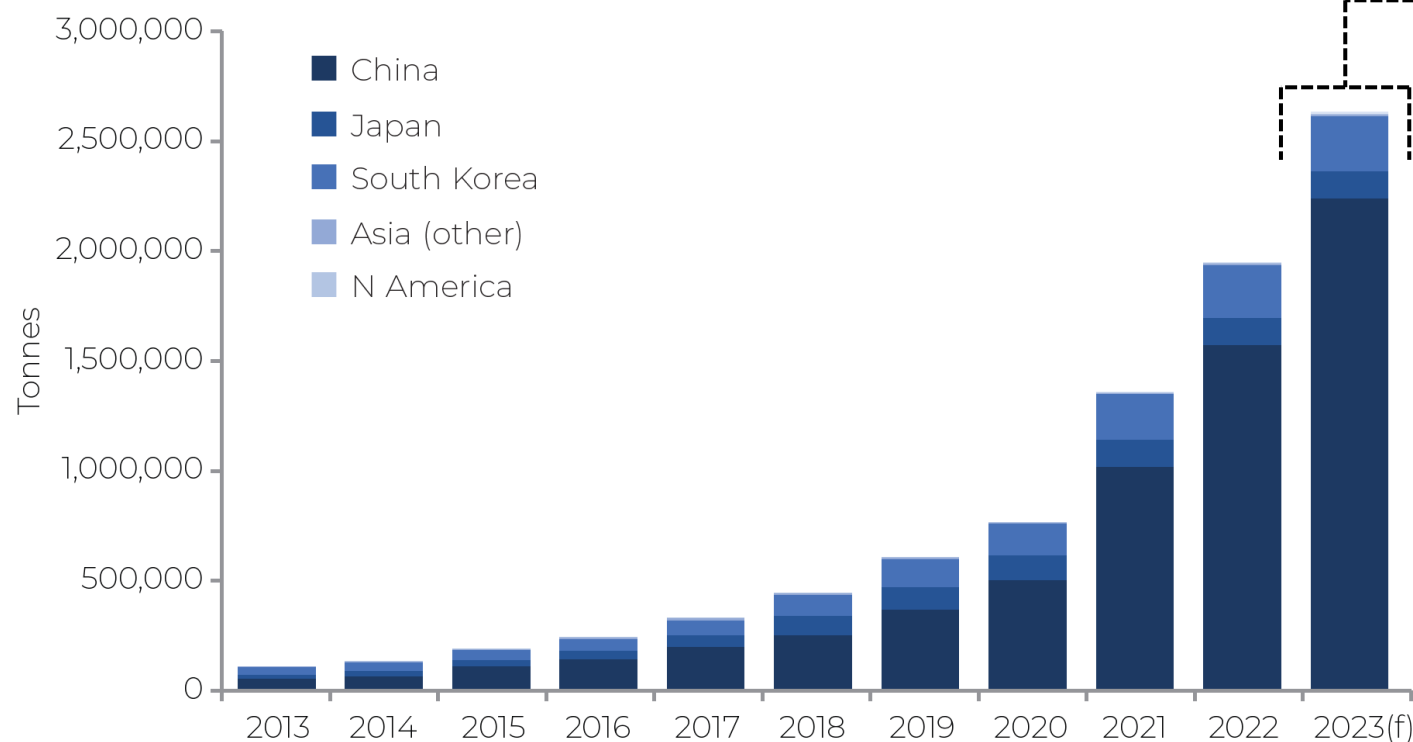
<sup>1</sup> Source: Benchmark Mineral Intelligence, "Benchmark Source" 1 February 2023

<https://source.benchmarkminerals.com/article/cathode-prices-fall-for-first-time-since-may-on-weaker-demand>

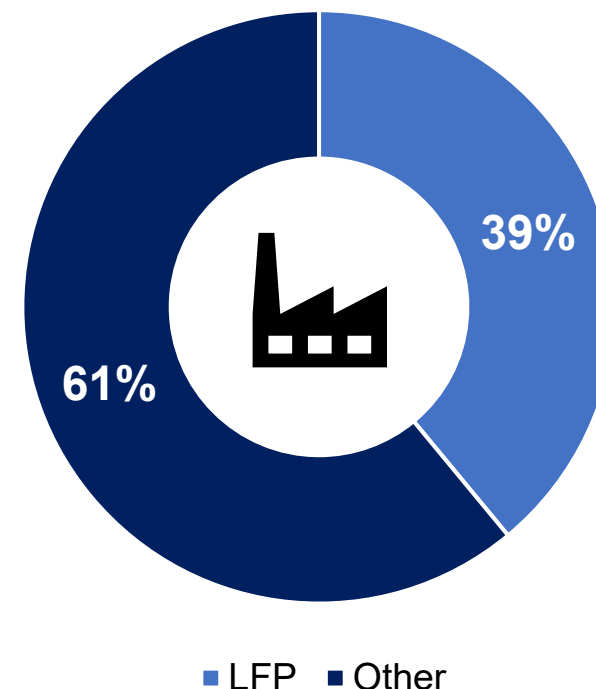
# Investment into LFP Cathode

Surging demand for cathodes continues to spur investment into new production capacity, with 74% of all plants under construction targeting the production of LFP cathode, reflecting the direction of the market

## Historical and Forecast Cathode Production<sup>1</sup>



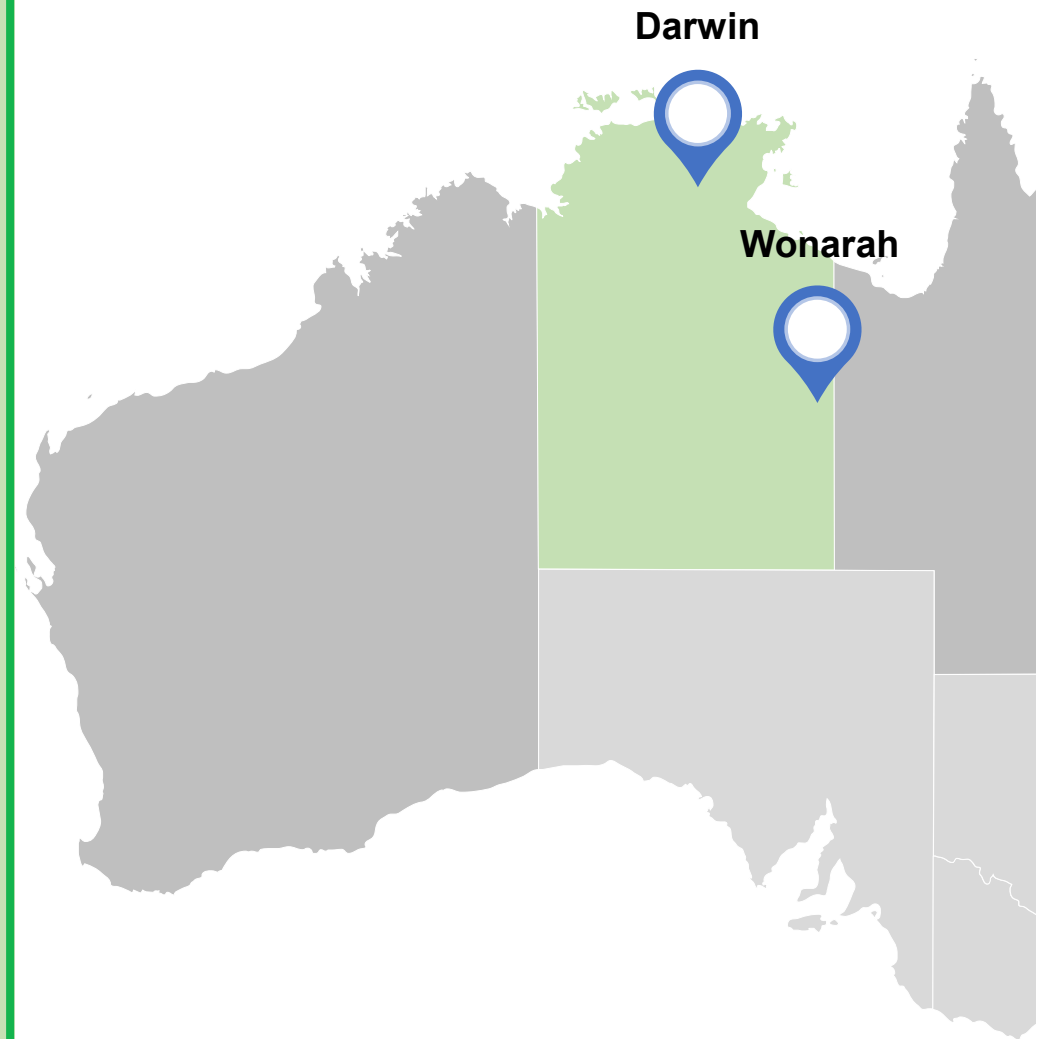
## 2023(f) Production Split



<sup>1</sup> Source: Benchmark Mineral Intelligence Cathode Assessment, January 2023

# LFP Scoping Study

- ✓ Scoping Study confirms the **technical and commercial potential** of an LFP Plant to be based in Darwin, Australia
- ✓ **Modular plant design** enables flexibility to scale and fund the project in stages
- ✓ Economics of the project have been considered at two scales of production:
  - ✓ **One-train plant**, 10,000tpa
  - ✓ **Three-train plant**, 30,000tpa
- ✓ Design and flowsheet based on our technology partner, Aleees' operating plant in Taiwan, **derisking the project**
- ✓ Standalone project, with **optionality to later use phosphate rock from** our 100% owned Tier-1 **Wonarah** deposit
- ✓ **Exposure to Lithium prices.** Cost plus margin pricing structure provides positive exposure Lithium prices, the largest cost component of LFP CAM
- ✓ **Alignment With Offtake Partners.** Australian sourced and produced LFP cathode product provides a commercially viable alternative to Chinese supply
- ✓ **Trialed and Proven Process Design** utilising Aleees' proprietary technology and flow sheet, based on Taiwanese operating plant, significantly derisking the project
- ✓ **Strong Government Support** from the Northern Territory State Government, with discussions continuing to progress





# Results: Lithium Upside, Scalability

The economics of the LFP Project has been considered at two scenarios, a one-train plant with capacity of 10,000tpa and a three-train plant with capacity of 30,000tpa, under both spot and forecast Lithium prices

<div>One-train</div> <div>10,000tpa</div>	Base Case			Upside Case – USD\$80,000/t LiOH & Li <sub>2</sub> CO <sub>3</sub>		
	NPV <sub>10%</sub>	IRR	Total Free Cashflow	NPV <sub>10%</sub>	IRR	Total Free Cashflow
	<b>\$138M</b>	<b>22.0%</b>	<b>\$682M</b>	<b>\$548M</b>	<b>44.2%</b>	<b>\$1,772M</b>
	<i>Net Present Value Post tax</i>	<i>Ungeared, Post Tax</i>	<i>Undiscounted Free Cashflow</i>	<i>Net Present Value Post tax</i>	<i>Ungeared, Post Tax</i>	<i>Undiscounted Free Cashflow</i>
<div>Three-train</div> <div>30,000tpa</div>	NPV <sub>10%</sub>	IRR	Total Free Cashflow	NPV <sub>10%</sub>	IRR	Total Free Cashflow
	<b>\$413M</b>	<b>22.4%</b>	<b>\$2,005</b>	<b>\$1,640M</b>	<b>45.1%</b>	<b>\$5,267M</b>
	<i>Net Present Value Post tax</i>	<i>Ungeared, Post Tax</i>	<i>Undiscounted Free Cashflow</i>	<i>Net Present Value Post tax</i>	<i>Ungeared, Post Tax</i>	<i>Undiscounted Free Cashflow</i>

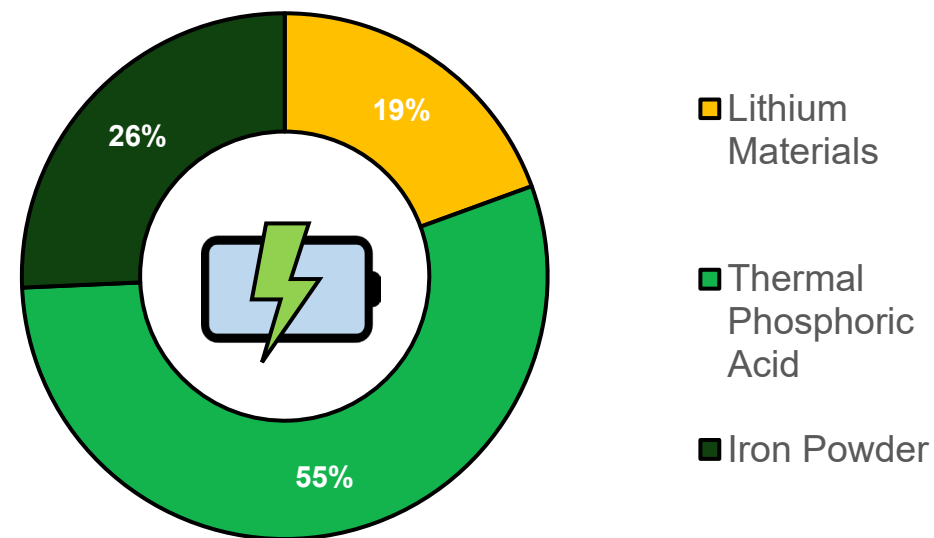
**Note:** Information presented is based on the Scoping Study for the LFP Cathode Manufacturing Plant Announcement, dated 2 March 2023.

# Avenira's Cost and Logistical Advantages

Geographic proximity to the under-supplied raw materials required to produce LFP, enables Avenira to have significant cost and logistical advantages relative to other LFP producers

- Australia supplies approximately 50% of the world's Lithium<sup>1</sup>, the largest raw material cost component of LFP. Regional proximity and **access to the worlds predominant Lithium producers** will facilitate significant transport cost benefits and supply-chain security
- Global supply disruptions in Phosphate markets have driven the price of Phosphate rock to record highs<sup>2</sup>. The Wonarah Project is one of the largest high-grade Phosphate rock deposits in Australia, and can potentially<sup>3</sup> provide a **secure supply of feedstock** to a TPA plant (Avenira owned or 3rd party), in turn supplying the LFP Plant
- LFP battery production capacity and intellectual property resides almost exclusively in China (>99% of global LFP). Avenira has partnered with Aleees, for the **intellectual property rights to produce LFP in Australia**.
- Electric vehicle manufacturers are diversifying their supply chains into non - Chinese jurisdictions, with **potential premiums for non-Chinese cathode providers**
- In July 2022, the US Inflation Reduction Act was passed, which contained tax credits and incentives to **reduce demand for Chinese battery imports, benefitting US trading partners**

Components of LFP CAM by Raw Material Mass



Phosphoric acid is the largest material input (by mass) to produce LFP

<sup>1</sup> Source: BBC, "How Australia became the world's greatest Lithium supplier" dated 11 November 2022

<sup>2</sup> Source: UTS, "Hidden casualty of Russia's war, global phosphorous security" dated 9 June 2022

<sup>3</sup> Avenira intends to initially develop the LFP Plant as a standalone project, with feedstock (including TPA) secured from third party providers.

# Our Partnership with Aleees

**Aleees is only one of three companies outside China with complete LFP cathode manufacturing capabilities, and patents for electric vehicle and stationary storage batteries**

- ❑ **Binding License and Technology Transfer Agreement signed with Aleees granting Avenira with the right to use Aleees' IP for the manufacture and global distribution of LFP cathode active material <sup>1</sup>**
- ❑ Aleees is a pioneer in the battery cathode market, with more than 120 exclusive patents worldwide on various types of products
- ❑ Our plant will emulate the process configuration, flowsheet and operations manual of Aleees' LFP plant in Taiwan, significantly derisking the development and on-going operations of the LFP Project
- ❑ The LFP plant will be the third Aleees technology plant and fourth in total after Aleees (Taiwan), FRYER (Norway) and ICL (USA). Being the fourth plant significantly reduces our technical and execution risk.
- ❑ The selected Aleees Licensed LFP Product is currently sold into electric vehicle (EV) and energy storage (ES) markets to 40 globally recognised name brand customers across Europe, U.S., Japan and Korea

## Aleees' Existing Licensees

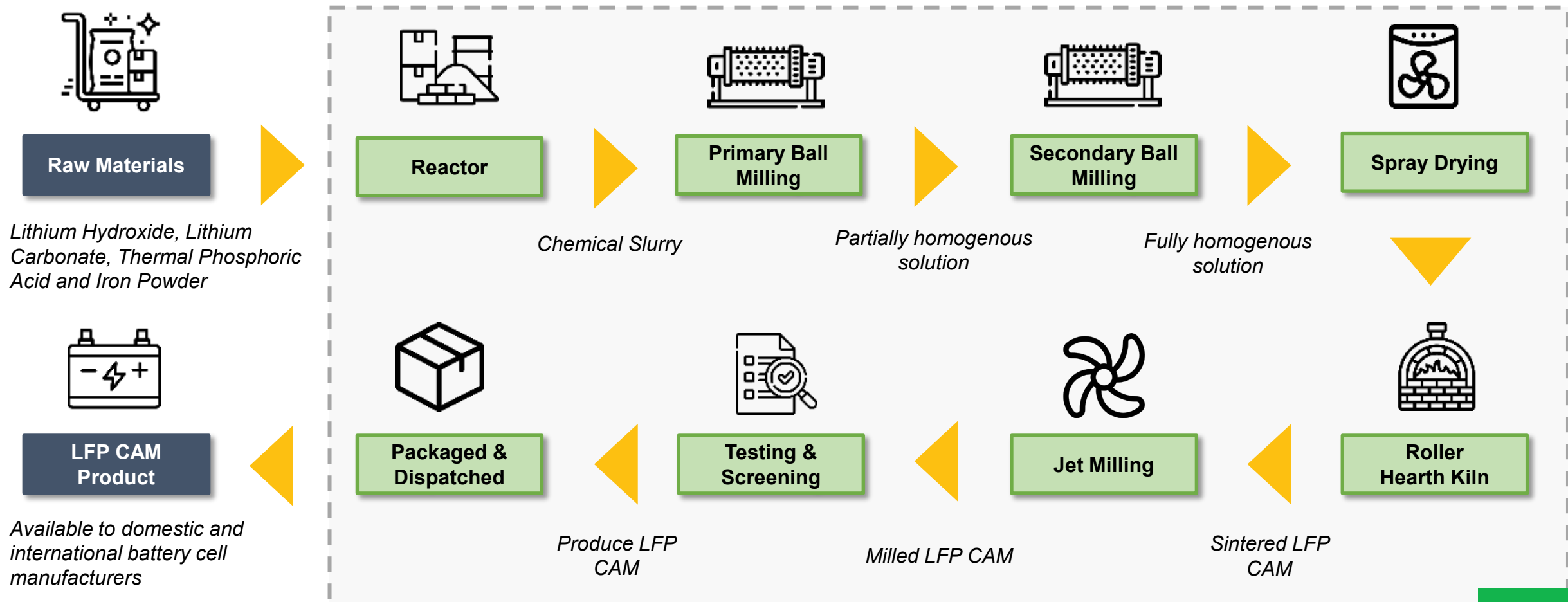


<sup>1</sup> Note: See Avenira ASX Announcement 26 September 2023.



# LFP Project Process Flow Sheet

Avenira's LFP Plant intends to adopt the patented LFP CAM synthesis process developed by its technology partner, Aleees. The following simplified block flow diagram illustrates the stages of the manufacturing process:



# LFP Project Funding Strategy

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**Avenira aims to secure funding to develop the one-train, 10,000tpa LFP Plant, and subsequently leverage the cash flows generated to finance and develop subsequent trains**

**☐ Avenira aims to explore the following sources of capital to finance the one-train LFP Plant:**

- ☐ Equity financing via public markets;
- ☐ Commercial debt from banks, credit funds and other sources; and
- ☐ Concessional debt funding from government agencies, including NAIF and EFA.

**☐ Avenira may also consider strategic investments from:**

- ☐ Strategic offtaker parties, such as battery and car manufacturers seeking to secure LFP cathode materials for the production of LFP batteries; and/or
- ☐ Key raw material suppliers, such as Spodumene and Lithium Hydroxide producers looking for downstream operational exposure to processed materials.

# LFP Project - Next Steps

Multiple near-term value drivers and exciting news flow anticipated:

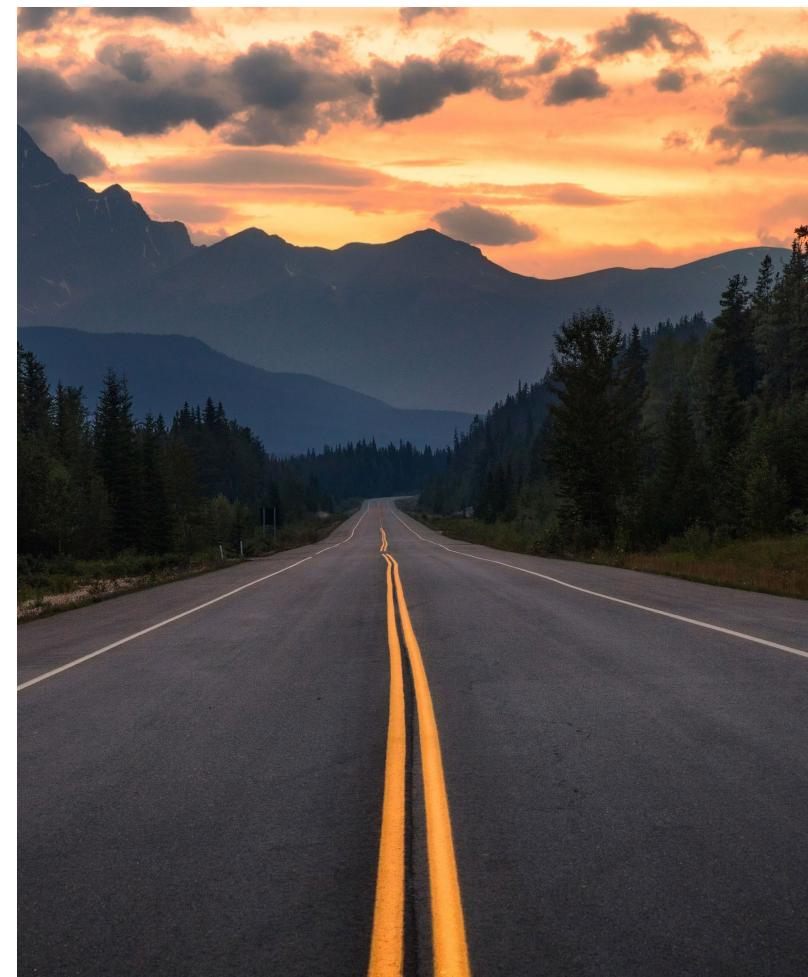
## Avenira's Lithium Ferro Phosphate (LFP) Project:

- ✓ *advancement of feasibility studies;*
- ✓ *site selection, permitting requirements and regulatory approvals;*
- ✓ *product qualification;*
- ✓ *funding discussions, including engaging with government funding agencies.*

*"The LFP Scoping Study demonstrates the technical and economic viability of the Company's modular train design to progressively scale production to meet the demand for electric vehicles and stationary storage"*

*"We look forward to providing shareholders with future updates as we progress"*

**- Avenira Chairman, Brett Clark**







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