2 March 2023

Avenira Delivers Strong Results from the Scoping Study for the LFP Cathode Manufacturing Plant

Avenira Limited (**Avenira** or the **Company**) is pleased to announce the results of the Scoping Study for the Company's 100% owned Lithium Iron Phosphate Cathode Manufacturing Project (**LFP Plant** or the **Project**) to be based in Darwin (the **LFP Scoping Study**).

The Project's strong economics and technical viability are encouraging, highlighting the potential for Avenira to become one of the leading Lithium Iron Phosphate Cathode Active Material (**LFP CAM**) producers globally, and one of the only LFP producers in the world based outside of China, Taiwan and Japan.

Scoping Study Parameters

Cautionary and Forward-Looking Statements

The LFP Scoping Study referred to in this announcement 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 announcement ("**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 announcement 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 announcement 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 announcement 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 announcement contains certain financial measures relating to the LFP Scoping Study that are not recognised 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.

Highlights

Under the Scoping Study, the economics of the LFP Plant have been considered at two initial scales of production, at 10,000tpa LFP CAM and at 30,000tpa LFP CAM:

Scenario	Trains	Production Capacity
Single-Train Plant	1	10,000tpa LFP CAM
Three-Train Plant	3	30,000tpa LFP CAM

Both scenarios demonstrate the solid financial robustness of the Project and highlight the optionality for Avenira to scale its operations progressively.

LFP CAM prices (and therefore Project revenues) are highly sensitive to movements in prices for Lithium Hydroxide and Lithium Carbonate.

Table 1 – SUMMARY OF LFP SCOPING STUDY KEY FINANCIAL OUTCOMES below have been prepared using the following price assumptions:

(a) Base Case Scenario: which applies the forecast prices contained in **Table 2**; and

(b) Spot Case Scenario: which applies recent reported spot prices of US$80,000/t for Lithium Hydroxide and Lithium Carbonate.[1]

A summary of the key results of the LFP Scoping Study is described below:

Table 1 – SUMMARY OF LFP SCOPING STUDY KEY FINANCIAL OUTCOMES

Parameter	Unit	10,000tpa Plant (1 Train)		30,000tpa Plant (3 Trains)	
		Base	Spot	Base	Spot
Avg. Realised LiOH Price	US$/t	18,533	80,000	18,533	80,000
Avg. Realised Li_2CO_3 Price	US$/t	17,305	80,000	17,305	80,000
$NPV_{10\%}$ Post-Tax	A$M	138	548	413	1,640
IRR Post-Tax	%	22.0%	44.2%	22.4%	45.1%
Payback Period	Years	3.5	2.0	3.5	2.0
Annual Production	tonnes p.a.	10,000		30,000	
Avg. LFP Basket Price	A$/kg	19.6	53.5	18.9	52.7
Avg. Cash Cost	A$/kg	14.9	41.0	14.4	40.5
Total Revenues	A$M	3,922	10,691	11,316	31,615
Total Operating Cost[2]	A$M	3,026	8,239	8,680	24,318
Total EBITDA	A$M	896	2,453	2,636	7,297
Total Free Cashflows	A$M	682	1,772	2,005	5,267
Pre-Production Capital	A$M	180		527	

[1] London Metals Exchange reported lithium hydroxide CIF spot between US$76,886/t – US$83,931/t between 30 September - 18 November 2022.
[2] Operating cost includes costs as described in Section 3.1, which exclude depreciation expenses.

Overview of the LFP Scoping Study

The Company commissioned Bechtel Australia Pty Ltd (**Bechtel**), an internationally recognised engineering, procurement, and construction management company, to work with the Company to complete the LFP Scoping Study. Bechtel was selected due to their expertise in mineral, energy and manufacturing projects. The Company's report is a Scoping Study cost estimate prepared to between -30% and +40% level of accuracy. The LFP Plant is a standalone development in Darwin. Avenira is currently in discussions with the Northern Territory Government and the Land Development Council for the allocation of industrial land near the port of Darwin.

The Scoping Study is based substantially on the flow sheet and process configuration of the existing LFP plant in Taiwan, owned and operated by our proposed technology partner, Advanced Lithium Electrochemistry (**Aleees**). The plant has a modular train-based design, providing flexibility to pursue several configurations for the size and location of the final LFP Project, allowing optionality to scale and finance the Project progressively. Avenira is also reviewing opportunities to utilise Aleees' operational plant in Taiwan to facilitate its customer product qualification process.

Commenting on the strong results of the LFP Scoping Study, Executive Chairman of Avenira, Brett Clark stated:

"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. This approach allows the Company to finance the LFP Project incrementally, using cashflows from our proposed initial 10,000tpa plant for expansion to 30,000tpa.

The LFP plant will be the third of its kind and the fourth in total. The design of the LFP Plant owned and operated by our proposed technology partner Aleees in Taiwan is currently being applied in Europe by FRYER[3] and in the USA by ICL[4]. Being the fourth plant significantly reduces our technical and execution risk. Our plant will target sales of LFP in the Asia-Pacific markets to electric vehicle (EV) and stationary storage manufacturers.

We believe the LFP Project is the key to unlocking the Northern Territory as the next leading Lithium battery metals supply chain hub. Our 30,000tpa LFP plant will create over 120 manufacturing jobs during operations, and will promote Australia's advanced manufacturing sector. We are excited about the prospect of working alongside the Northern Territory Government on this significant economic and strategic opportunity.

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

[3] FREYR Joins Race to Make LFP Batteries at Gigawatt-Scale in Europe, Energy Storage News.
[4] ICL Signs MOU with Aleees for Production of LFP Battery Cathode Materials, ICL Company Website

Contributors

	Scope	Contribution
1	Process Design Package	Aleees
2	Taiwan LFP Plant Visit	Avenira, Bechtel
3	Balance of Plant, Facility Cost Estimate	Bechtel
4	Darwin Site Inspection	Avenira
5	Renewable Energy	Flukes Value Management
6	Project Schedule	Bechtel
7	Logistics	Avenira
8	Marketing	Benchmark Minerals, Aleees, SMM
9	Financial Evaluation	Aleees, Burnvoir Corporate Finance
10	Environmental and Regulatory Approvals	Avenira

Next Steps

Avenira will progress the feasibility studies for the LFP Project based on the production parameters considered in the Scoping Study.

Concurrently, the Company will also continue to progress:

- discussions with Aleees towards a definitive technology licence agreement;
- site selection, product qualification, permitting requirements and regulatory approvals; and
- financing discussions, including engaging with government funding agencies.

This announcement was authorised for release by the Board of Directors.

For further information, contact:

Brett Clark
Executive Chairman
M +61 408 941 557

1. Company Strategy

Avenira is currently targeting the development of three standalone projects:

- Direct Shipping Project (**DSO Project**) to export phosphate rock to regional offtakers;
- **LFP Plant** that will produce and supply LFP CAM to domestic and international Lithium-ion battery cell manufacturers, with opportunities to scale production in stages; and
- Thermal Phosphoric Acid plant (**TPA Project**) to produce battery-grade TPA, capable of supplying feedstock to the LFP Plant and for sales into other specialty chemical markets.

Avenira intends to initially develop the LFP Plant as a standalone project, with feedstock (including TPA) secured from third party providers. The following options are currently being investigated for the supply of TPA for the LFP Plant:

- Purchase TPA from qualified third-party suppliers in China;
- Securing a tolling arrangement with a regional battery-grade TPA producer to establish a capital-light and long-term source of feedstock for the LFP Plant; and
- Once the LFP Plant is established, Avenira plans to develop its TPA Project, to supply battery-grade TPA to the LFP Plant. This will establish an integrated local supply chain for the production of LFP CAM. Avenira intends to use ore from its 100% owned Tier-1 Wonarah high-grade phosphate deposit as feedstock for the TPA Project.

The production of LFP CAM requires several processed raw materials, including Lithium Hydroxide and Lithium Carbonate. The Company is targeting customer offtake arrangements with Tier-1 battery manufacturers that have existing and ongoing Lithium Hydroxide and Lithium Carbonate supply arrangements[5]. Other materials, such as Iron powder and other reagents will be purchased from external third-party suppliers.

Avenira plans to have prospective offtakers direct their Lithium Hydroxide and Lithium Carbonate supplies to the LFP Project for the purposes of manufacturing LFP CAM. The Company endeavours to structure its offtake arrangements to allow the LFP Project to recover costs associated with the procurement of these processed materials, plus a fixed percentage profit margin.

The profit margin is expected to be a fixed percentage pegged to the cost of production, including the pre-production capital costs. The proposed offtake arrangement will allow the LFP Project to recover the cost of production and provide positive market exposure to the basket of raw materials and energy required for the manufacture of LFP CAM, including Lithium materials, TPA, Iron powder and other reagents.

Avenira management understands that the proposed offtake structure is consistent with the existing pricing structure for LFP CAM used both in China and Taiwan. Avenira intends to initiate discussions with battery cell manufacturers to define these offtake arrangements further.

As the demand and supply deficit for LFP CAM develops, Avenira may revise its offtake structure to take advantage of the changing market dynamics.

[5] Engagement with potential product offtakers is at an early stage and there is no assurance that any engagement with potential customer(s) will result in a binding offtake agreement.

2. Market for LFP CAM

LFP CAM is used to make LFP Lithium-ion batteries, which are currently estimated to represent approximately 30% of the total Lithium-ion battery market. UBS analysis forecast LFP market share to increase to 40% of the global market by 2030, as a result of the improved driving range performance of LFP batteries[6].

The growth in Lithium-ion batteries is expected to be driven primarily by increased demand for electric vehicles (**EV**), which constitute approximately 82% of the total current Lithium-ion battery market. EV sales are expected to reach 20.9m units by 2025, equating to a 20.9% penetration rate. It is estimated that EV demand increased 43% from 2021 to 2022 and will exhibit a CAGR of 21% over the next ten years[7].

LFP batteries have several key advantages relative to other Lithium-ion battery chemistries:

- **Cost**: Based on a 2020 report published by the Department of Energy, LFP, on average, is 6% cheaper than NCM by kWh, with LFP also lasting about 67% longer than NCM (more cycles)[8];
- **Safety:** LFP is widely considered safer than most other cathodes, with LFP cells being more resistant to ignition or fire sparks in the event of thermal overload[9];
- **Sustainability:** Human rights and environmental concerns regarding the mining of Cobalt have thrown into question the sourcing and sustainability of NCM cathodes; and
- **Cycle-Life:** LFP cells experience a slower rate of capacity loss and often have a considerably longer life cycle than other Lithium-ion battery chemistries[10].

LFP batteries were amongst the earliest adopted electric vehicle battery technologies globally due to their stable and safe performance characteristics. LFP has long been almost exclusively produced in China due to intellectual property rights and was the preferred battery chemistry technology.

The cathode component in Lithium-ion batteries defines the power and overall capacity of the entire battery cell. Cathodes contain active materials comprised of micro-particle metallic powders that have different characteristics depending on the ratio, configuration and type of metals used in the cathode.

Over the past two decades, battery cell manufacturers have reverted to Nickel-Cobalt-Manganese (**NCM**) style cathodes, as they possess a greater energy density and higher power output. However, recent subsidy cuts in China, a desire for safer battery cells, improved driving range characteristics for LFP cathodes, and extreme volatility exhibited in the price of Nickel and Cobalt have reinvigorated the interest of battery cell manufacturers in LFP cathodes.[11]

This was exemplified by Tesla in 2021 when it announced that it would be shifting to LFP cathodes in its standard-range vehicles[12]. More recently, Ford, Volkswagen, Stellantis and

[6] UBS Raises LFP Global Battery Market Share Outlook, S&P Global Commodity Insights,
[7] Based on an independent market intelligence consultant subscribed to by the Company.
[8] 2020 Grid Energy Storage Technology Cost and Performance Assessment, US Department of Energy
[9] Rechargeable Lithium Batteries, Electropaedia – Battery and Energy Technologies
[10] Lithium Iron Phosphate, PowerTech Advanced Energy Storage Systems
[11] Focus: The war between EV battery cathodes, Fastmarkets
[12] Ford, VW, Tesla Lean in to LFP Battery Technology for EV, Environmental Leader

Rivian (amongst others) have all stated their intentions to incorporate LFP cathodes into their electric vehicle models[13].

Manufacturers are currently facing increasing pressure to diversify their supply chains away from China, with recent developments including:

- The United States Inflation Reduction Act of 2022 includes an estimated $369 billion in investments including, $7,500 federal consumer tax credit, starting in 2023 based on the origin of materials and localisation of manufacturing;

- ICL, a leading global fertiliser and specialty minerals company announced plans to build a US$400m LFP manufacturing plant in St. Louis, USA, set to come online in 2024[14]. ICL is using Aleees' technology for the development of their plant. ICL was awarded US$200m in grant funding from the U.S. Department of Energy;

- 6K, a leading company specialising in the development of engineered materials for various industries, is developing a demonstration plant for the production of NCM811 and LFP battery chemistries with a 3,000tpa capacity set to come online in 2025 and increasing capacity to 10,000tpa by 2026. The project has also been awarded US$100m in grant funding from the US. Department of Energy;

- Ford and CATL have proposed the development of a joint venture LFP plant that will be located in Northern America and will supply LFP cathode materials directly into Ford's Electric Vehicles[15]; and

- American Battery Factory announced it is investing US$1.2bn into the construction of a commercial LFP production factory in Arizona, USA[16].

[13] Will Rising Lithium Prices Put An End To Trend Toward LFP Battery Cells for EVs? CleanTechnica
[14] "Aleees to Provide Technology for ICL Group's LFP Cathode Facility in US", November 2022, Energy Storage News
[15] "Ford, China's CATL Mull Workaround for New US Battery Plant with US-Chinese Tensions High", December 2022, Bloomberg
[16] "American Battery Factory's First 'Gigafactory' Inches Towards Reality", December 2022, Techcrunch

3. Project Financial Analysis

Avenira has conducted preliminary financial analysis to evaluate the economics of the LFP Project using a combination of cost assumptions from the Scoping Study, commodity price forecasts obtained from market intelligence agencies, and management assumptions.

3.1 Material Assumptions

Material financial assumptions adopted in the analysis include:

- **Cost plus margin pricing structure:** LFP CAM price is calculated based on a cost plus fixed percentage margin basis. The price is calculated to recover all operating costs associated with the production of LFP CAM, including the cost of raw materials, production costs, and capital expenditures plus a fixed percentage profit margin over these costs[17].

  This pricing structure has been advised by Aleees;

- **Commodity Price Forecasts:** The forecast costs that have been applied for raw materials required for the production of LFP CAM are shown in Table 2 below:

Table 2 – Assumed Raw Material Costs[18]

Material	Unit	2026	2027	2028	2029	2030	2031	2032	2033-2045	Avg.
Lithium Hydroxide	**US$/tonne**	30,000	26,650	23,900	21,125	18,875	17,500	16,800	16,600	20,200
Lithium Carbonate	**US$/tonne**	28,500	24,500	21,500	19,000	17,500	16,500	15,800	15,600	19,027
Thermal Phosphoric Acid (TPA)	**US$/tonne**	2,063	2,063	2,063	2,063	2,063	2,063	2,063	2,063	2,063
Iron Powder	**US$/tonne**	1,502	1,502	1,502	1,502	1,502	1,502	1,502	1,502	1,502

The grade each of the raw materials is shown below:

- **Lithium Hydroxide (LiOH):** Battery Grade
- **Lithium Carbonate (Li_2CO_3)**: Battery Grade
- **TPA (H_3PO_4)**: Food or Battery Grade H_3PO_4 concentration 85%
- **Iron Power (Fe)**: metallurgical battery grade powder Fe concentration >99%

Other raw material costs and associated cost assumptions used in the financial analysis have been sourced from the parameters defined by the Avenira, Aleees and marketing consultants including cost information relating to the price of chemical reagents, fructose and power.

- **Technology Licensing Fee:** Discussions with Aleees for the right to use its intellectual property to synthesise LFP CAM are ongoing. The LFP Scoping Study has assumed a

[17] Certain relatively minor costs not directly related to LFP production (such as corporate costs) are excluded from this price structure.
[18] Amounts in real dollars. Forecast prices for Lithium Hydroxide and Lithium Carbonate for the period to 2032 are based on Benchmark Mineral Intelligence, and assumed to be straightline after that date. Forecast costs for TPA and Iron Powder are based on data published by SMM Consultants and Aleees, respectively.

licence fee that is consistent with current negotiations and with the requirements of both parties;

- **Construction Period:** Construction has been assumed to take place over two years;
- **Production Life:** The operating life of the project is assumed to be 20 years;
- **Maintenance costs:** Maintenance costs are estimated to be 3% of the capital costs of the plant equipment;
- **Property Leasing:** Avenira is in discussion with the Northern Territory Government for the allocation of an industrial site near the port of Darwin for the LFP Project. Management has assumed a market-based annual lease payment for the allocation of such industrial land;
- **Owner Costs:** Management has applied its own estimates for owner's costs including corporate office costs, consultant costs, insurance and legal costs. These costs are not included in the LFP CAM price under the cost-plus margin pricing structure;
- **Tax:** Corporate tax rate of 30% and tax losses carried forward have been used;
- **Working Capital:** No adjustments have been made for changes in working capital;
- **Inflation:** Prices and costs are presented on a real basis; no escalation has been assumed; and
- **Foreign Exchange:** 0.65 AUD/USD exchange rate has been assumed.

3.2 Qualifications

The following are the qualifications on the basis on which the LFP Scoping Study is prepared:

- Costs are prepared under an EPCM approach;
- Sufficient power and water supply are assumed to be available on site;
- Costs are estimated on a greenfield approach; and
- Cost impacts due to potential access restrictions to the Project work areas have not been considered.

3.3 Capital Costs

Table 3 - Pre-Production Capital Costs including contingency

Scenario	10,000tpa Plant (1 Trains)		30,000tpa Plant (3 Train)	
	A$M	%	A$M	%
Direct	86	48%	253	48%
Indirect	43	24%	126	24%
Escalation	9	5%	26	5%
Contingency	41	23%	121	23%
Total	**180**	**100%**	**527**	**100%**

Pre-production capital direct costs relate to plant equipment and associated infrastructure required for the construction of the plant, including costs such as site works, concrete, steel, architectural, piping, electrical bulk, pumps, plant equipment, etc.

Indirect costs relate to associated costs included during construction, such as temporary construction facilities, construction equipment, tools supplies, professional services and spare parts for the plant.

3.3.1 Methodology

The methodology to estimate the capital and operating costs (as described in section 3.1) of the Project:

- Process design and equipment sizing by Aleees
- Quotations for specialist equipment by Aleees;
- Referential sizes, lengths and footprints supplied by Aleees for main facilities and buildings; and
- Prepared under an EPCM approach.

3.3.2 Capital Costs Pricing Basis

Equipment costs are based on estimates provided by Aleees on a 10,000pta per train basis, including:

- Primary Mills & Secondary Mills;
- Spray dry area;
- Sintering area;
- Jet mill area;
- Product screening and packaging area; and

- Pricing for bulk materials, such as concrete all-in, structural steel, siding, pipes, cables and others, based on a Project being constructed in Australia.

3.3.3 Indirect Costs

The capital costs above include the following assumptions:

- Additional costs for vendor representatives of 2% of total plant equipment cost have been included;
- Construction workers are assumed to be housed in towns around the work area. Therefore, no camp and catering costs during construction;
- Additional common distributable costs have been included based on a 15% material cost;
- Additional freight costs have been assumed to be 15% of total plant equipment and bulk material costs;
- Additional costs for spare parts have been assumed to be 5% of total plant equipment cost;
- Professional services costs, including both home and field offices staff, are factored based on 20% of total direct costs; and

Management believes there is a reasonable basis for the assumptions used throughout the financial analysis and that the results expressed within the Scoping Study are fair.

4. Qualifications & Exclusion

4.1 Qualifications

Pre-production capital cost items have been excluded from the Scoping Study:

- All and any current or future impact due to the impact of pandemics, such as Covid 19, including the following:
    - Impact on vendor fabrication and delivery
    - Impact due to social distancing restrictions
    - Occupancy arrangements in the home office
- Development of operational readiness activities, such as training, operation and maintenance processes and procedures above and beyond what the equipment vendors provide;
- Operating labour and personnel for commissioning or start-up activities;
- No topographical data considerations have been considered in this Scoping Study;

- Allowances for direct manual wage rate for unexpected and significant market changes or site-specific conditions in the future;
- Project financing fees and interest during construction;
- Any special requirement due to the participation of outside financing sources;
- Initial start-up costs, such as:
    - Owner's hiring and training of personnel for start-up and operations
    - Plant operating costs (as described in section 3.1)
    - Stocks of operating supplies and consumables
    - Capital replacements, e.g., pump liners and mobile equipment
    - Start-up and commissioning support
    - Manual labour

5. Sensitivity Analysis

Under the proposed revenue structure described above, the Project is forecast to generate sufficient revenue to recover production costs while providing upside exposure to raw material prices used to manufacture LFP CAM, with movements in the price of Lithium being the most pronounced. Under this structure, higher raw material costs generate stronger financial outcomes.

Shown below is the sensitivity of the Project's NPV to changes in raw material prices and pre-production capital costs relative to the base case forecast prices used:

Table 4 - Project Sensitivity to Commodity Prices and Capital Costs

Item	% Change	$NPV_{10\%}$ (A$M) 10,000tpa (1 trains)	$NPV_{10\%}$ (A$M) 30,000tpa (3 train)	IRR (%) 10,000tpa (1 trains)	IRR (%) 30,000tpa (3 train)
Lithium Hydroxide (Material)	-40%	91	272	18.2%	18.5%
	-20%	114	342	20.1%	20.4%
	0%	138	413	22.0%	22.4%
	+20%	162	484	23.8%	24.2%
	+40%	185	555	25.6%	26.1%
Lithium Carbonate (Material)	-40%	130	390	21.4%	21.8%
	-20%	134	402	21.7%	22.1%
	0%	138	413	22.0%	22.4%
	+20%	142	425	22.3%	22.7%
	+40%	146	436	22.6%	23.0%
Thermal Phosphoric Acid (Material)	-40%	122	366	20.9%	21.1%
	-20%	130	390	21.4%	21.6%
	0%	138	413	22.0%	22.2%
	+20%	146	437	22.5%	22.8%
	+40%	154	460	23.1%	23.4%
Iron Powder (Material)	-40%	132	396	21.6%	22.0%
	-20%	135	405	21.8%	22.2%
	0%	138	413	22.0%	22.4%
	+20%	141	422	22.2%	22.6%
	+40%	144	430	22.4%	22.8%
Capital Costs	-40%	158	472	30.7%	31.5%
	-20%	148	443	25.4%	25.9%
	0%	138	413	22.0%	22.4%
	+20%	128	384	19.6%	19.9%
	+40%	118	354	17.8%	18.0%

Table 5 - Project Sensitivity to Discount Factor and Operating Costs

Item	Change	$NPV_{10\%}$ (A$M) 10,000tpa (1 trains)	$NPV_{10\%}$ (A$M) 30,000tpa (3 train)	IRR (%) 10,000tpa (1 trains)	IRR (%) 30,000tpa (3 train)
Discount Factor (%)	8%	181	539	N/A	N/A
	9%	158	473	N/A	N/A
	10%	138	413	N/A	N/A
	11%	120	360	N/A	N/A
	12%	103	311	N/A	N/A
Operating Costs (w/o pass through)[19]	-15%	259	763	30.5%	30.8%
	0%	138	413	22.0%	22.4%
	+15%	17	64	11.8%	12.3%

[19] Operating Costs (w/o pass through) constitutes an increase in operating costs that are not captured in the LFP CAM price, as per the cost-plus margin offtake pricing structure. This does not include corporate costs or any owner costs.

6. Plant Layout and Equipment

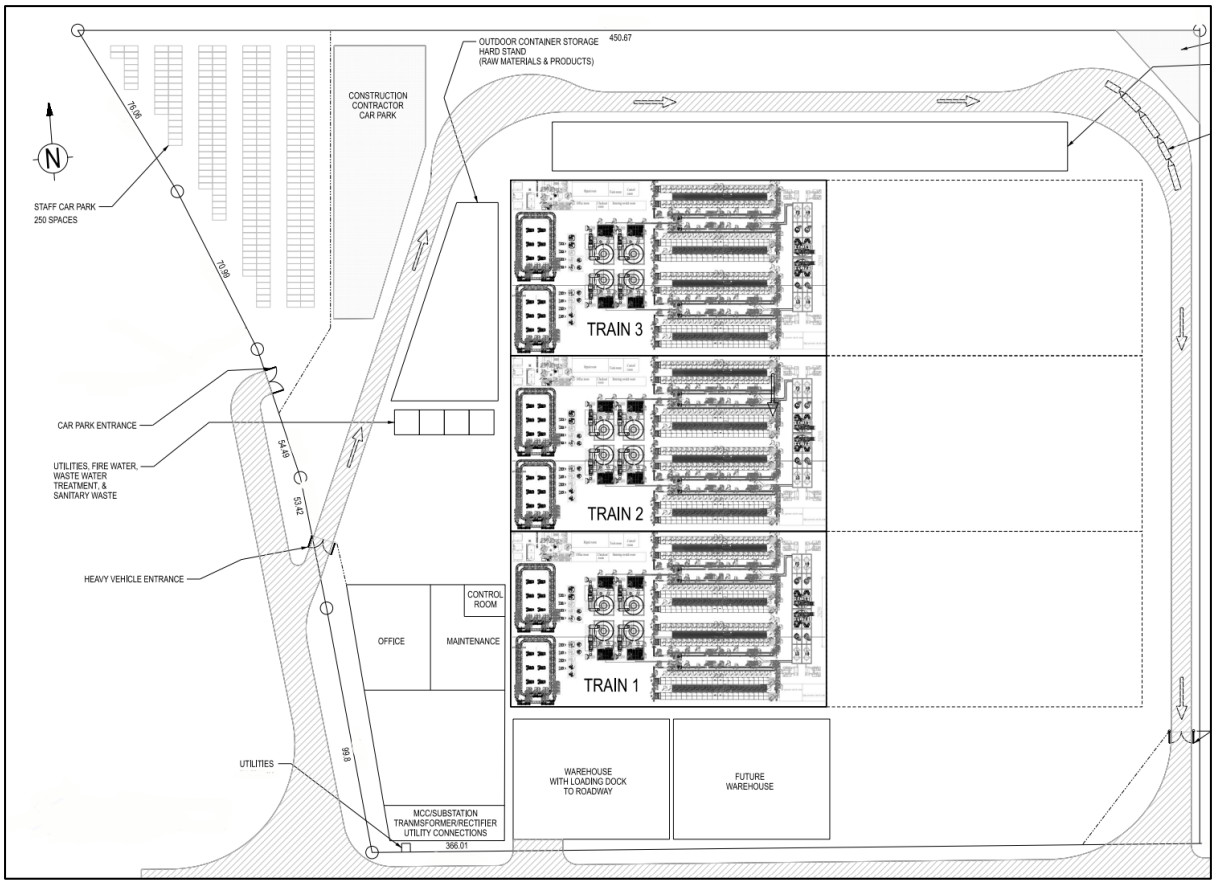
6.1 Plant Layout

The LFP Project is designed based on 10,000tpa of LFP CAM per train. Each train will be installed independently, allowing flexibility for operational expansion and land configuration. Main plant equipment will be supplied as modules, with no significant field installation work required barring connection and integration of individual trains.

Power supply from the grid is sufficient for both a one and three-train plant in Darwin. An additional gas-fired power plant with grid supply as a backup will be required for production cases in excess of three-trains. In both instances, municipal water connection is available at the plant boundary.

The LFP Plant block layout for the one-train plant and three-train plant is shown below.

Figure 1 – LFP Train Layout



6.2 Permits and Approvals

The LFP Project requires multiple levels of regulatory approvals and stakeholder engagement

- **Land Allocation:** Avenira is in discussions with the Northern Territory Government for site selection of the LFP Plant. Several potential sites in industrial estates have been identified around Darwin with the view to optimising the approval process for the LFP Project. The potential industrial land may also include key infrastructure and baseline investigations to accelerate preparation of LFP plant environmental and regulatory applications.

- **Environmental and Regulatory Assessment:** Following site selection, Avenira will commence an environmental and regulatory approvals study for the LFP Project. This will involve a comprehensive analysis of the environmental risks and impacts associated with the Project, and mitigation strategies designed to reduce potential impacts. Avenira believes the process could be shortened and simplified, depending upon the extent of existing baseline investigations and approvals at the (to be) selected industrial site.

  In undertaking the environmental and regulatory approvals study, Avenira will engage with relevant NT Government agencies with respect to the necessary approvals for the LFP Project, the information required to support them, and the approvals pathway. The engagement with the NT Government agencies will inform their requirements for the approvals and the expected timeframe for approval. The specific approvals required for the Project and the information required to support the approvals may include:

  - Commonwealth Department of Climate Change, Energy, the Environment and Water for Maters of National Environmental Significance (if applicable)
  - NT Department of Environment, Parks and Water Security, including NT Environment Protection Authority
  - NT Department of Infrastructure, Planning and Logistics, including the Development Assessment Services, and Transport and Civil Services
  - NT PowerWater Corporation
  - NT Aboriginal Areas Protection Authority
  - NT Worksafe

  The levels and pathways of approval will depend on the outcome of initial discussions, including risk analysis, that are part of the Pre-Lodgement meetings with the relevant authorities. Environmental approval is expected to encompass both construction and operation in the same application. A Town Planning Report will likely be required to apply for the construction permit approval.

6.3 Equipment List

The major equipment list for each 10,000tpa LFP CAM train and respective process area, as provided by Aleees is shown below:

Table 6 – Major Equipment List

Process Area	Equipment
Mill Stage 1	Automatic Batching System
	Reaction Tank
	Ball Mill Machine
	Fructose Blender
Mill Stage 2	Dispersion Tank
	Ball Mill Machine
	Buffer Tank
Spray Dry Area	Spray Dryer
	Pneumatic Conveying System
Sintering Area	Single Layer 6 Columns RHK
	Sieving Machine
	Pneumatic Conveying System
Jet Mill Area	Jet Mill Machine
	Pneumatic Conveying System
	Mixer
Packaging Area	Sieving Machine
	Magnetic Separator
	Package Machine
Power System	Air Compressor
	Hot and Cooling Water System
	DI-Water System
	Nitrogen Generator
	Sewage Treatment

7. Process Design

The LFP Plant will adopt the licensed LFP CAM synthesis process developed by Aleees. The flow sheet and process configuration provided for Avenira's LFP Plant has been designed from the layout and flow sheet of the Aleees LFP Plant currently in production, located in Taiwan.

The primary raw materials and utilities required to produce LFP CAM, and their respective unit consumption per tonne of LFP CAM produced are detailed below:

Table 7 – Raw Material Costs and Utility Rates for LFP CAM Production

Raw Materials & Utilities	Unit	Consumption / Tonne of LFP
Phosphoric Acid	tonne	0.8
Iron Powder	tonne	0.4
Lithium Hydroxide	tonne	0.2
Lithium Carbonate	tonne	0.04
Water	m^3	5.7
Power (incl. allowance for services)	MWh	6.6
Natural Gas	GJ	6.5

The LFP CAM production process includes the following steps, described in more detail below:

7.1 Raw material mixing

The LFP CAM production process begins with each of the raw materials being delivered in sealed bags and unloaded into their respective storage locations within the LFP Plant.

Lithium Hydroxide, Lithium Carbonate, Iron Powder and Phosphoric Acid are then weighted and sequentially added into a series of agitated reactors. Within the reactors, the Iron Powder and Phosphoric Acid react to produce Iron Phosphate, which in turn is mixed with Lithium Hydroxide and Lithium Carbonate to form a chemical slurry.

7.2 Two-stage milling

Discharged from the reactor, the slurry is then mixed over an extended period of time until it forms a nearly homogenous solution, which is then sent to a two-stage mill that grinds any remaining solids in the slurry into small-sized particles, almost entirely homogenising the solution.

7.3 Dry spraying

From there, the mixture is sent for spray drying, where exposure to atmospheric pressure and high temperature evaporates any remaining water in the slurry, leaving only a dry

powder, which is transferred to a rotary hearth furnace for sintering, producing the final LFP CAM product.

7.4 Sintering

The sintering process causes coating of the outside of the LFP CAM particles with carbon, which enhances the conductivity and electrochemical properties of the final LFP CAM product.

7.5 Jet milling

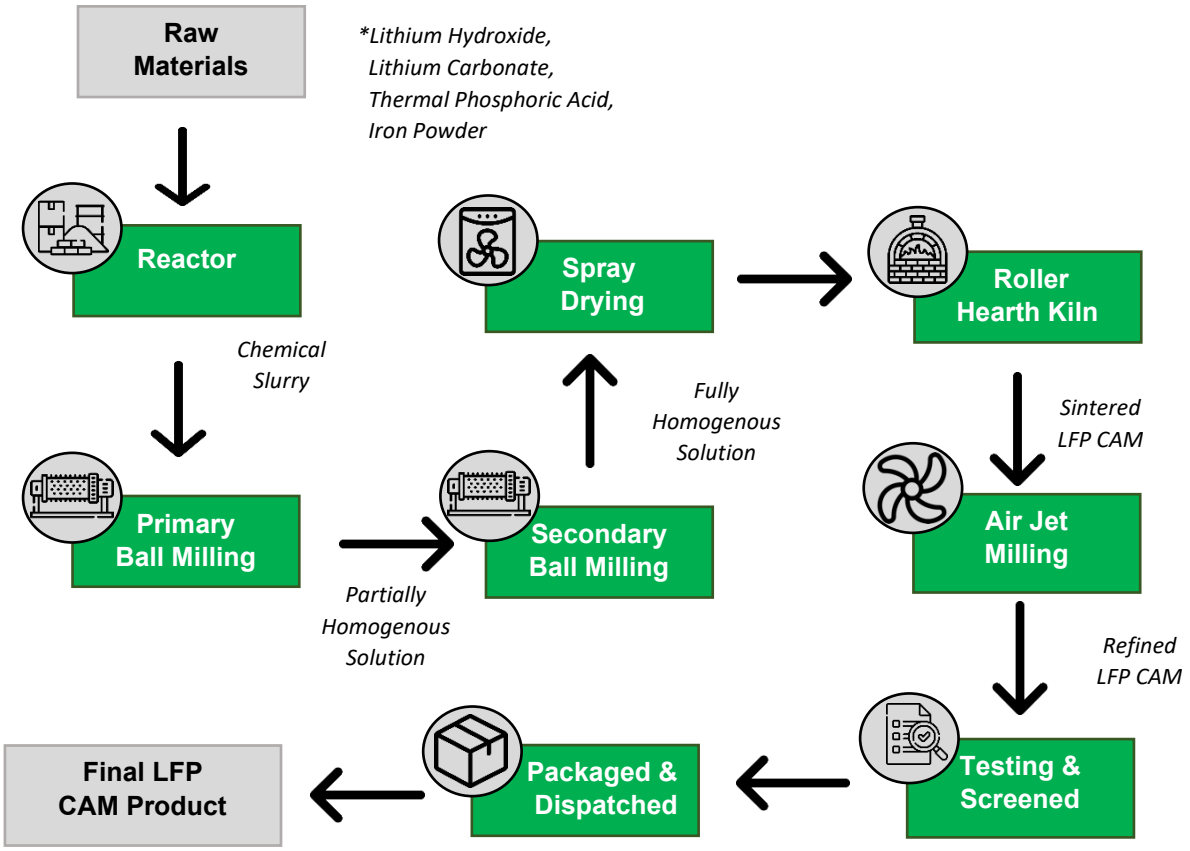
The carbon coated LFP CAM is then transferred to a jet milling area to allow the material to disperse into fine particles.

7.6 Screening and packaging

From there, the batch is sample tested, screened, and subjected to rigorous magnetic contaminant removal before it is packaged and dispatched to customers.

The overall block flow diagram, illustrating all stages of the LFP CAM synthesis process, are shown below:

Figure 2 – LFP Plant Block Flow Diagram



8. Funding Strategy

Avenira's target is to maintain 100% ownership of the LFP Project by funding via a combination of debt and equity capital. Avenira has appointed BurnVoir Corporate Finance as its financial advisor in relation to the procurement of development funding.

Avenira aims to explore the following sources of capital to finance the 10,000tpa 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.

Avenira intends to leverage forecast cash flows generated from the proposed 10,000tpa LFP Plant to secure further financing to develop subsequent trains.

At the current stage of the LFP Project, it is too early to have any definitive funding solutions. However, these will be explored in parallel with future feasibility studies.

Investors should note that there is no certainty that the Company will be able to raise the funding required when needed. It is also possible that such funding may only be available via equity funding which may have a dilutive effect on the Company's share value. The Company may also pursue other strategies in order to realise the value of the Project, such as a sale, partial sale or joint venture of the Project. If this occurs, this could materially reduce the Company's proportionate ownership of the Project.

9. Indicative Schedule and Construction Timeline

The indicative schedule for the LFP Plant is shown below in **Figure 3**.

Figure 3 – LFP Plant Indicative Execution Schedule

Avenira Execution Schedule	Year 1				Year 2				Year 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Initial Project Setup & Definition												
LFP FEED												
Aleees Design Package Developed												
Environmental Approval - NT												
Financial Investment Decision (FID)												
Funding												
Engineering												
Design												
Procurement												
Award Long Lead Equipment												
Manufacture / Fabrication / Assembly												
Shipment to Site Delivery Long Lead Equipment												
Construction												
Prepare Site - Darwin												
Construct Building												
Install Equipment												
Commissioning												
Pre-Commissioning / Commissioning / Ramp up												

Commencement of the construction timeline is not certain, due to the substantial amount of work that needs to be undertaken as part of the BFS for the LFP Project. Avenira intends to provide further timing certainty following completion of the BFS.

Schedule duration is also driven by a number of critical pathway activities, including:

- Engineering studies to define all physical aspects of the Project, including capital costs;
- Procurement of long-lead equipment – assumed during the feasibility study;
- Construction and pre-commissioning;
- Project funding is available to support the continuous flow of engineering, procurement and construction expenditures;
- Suitable land is available, with timely access to the site during the engineering phase;
- An adequate laydown area is available near the job site for material storage, and assembly; and
- Governmental and legislative compliance is obtained.

10. Key Project Risks

Avenira has identified the following key risks facing the project:

10.1 Technology Risk

- **New Technology:** LFP CAM technology is still relatively new, and there is limited commercial experience in the technology outside of China. There may be unforeseen issues or challenges that arise during the development, construction and operation of the plant. As an emerging technology there may be uncertainties around the performance, reliability and cost of running the plant. These uncertainties may create issues related to project delays, cost overruns and lower than expected production volumes, which could have a negative impact on the commercial viability of the project.

- **Complexity:** LFP CAM technology involves a series of chemical reactions which require careful control, monitoring and oversight. The process involves the use of hazardous chemicals which require strict safety measures. These factors paired with the prospect that the LFP CAM produced by the plant may not meet customer specifications pose significant risks to the feasibility of the project.

- **Phased Out:** Battery chemistries are rapidly evolving and improving. New innovative chemistries are constantly coming online with new and improved features. As new technologies emerge and become commercially viable, there is a risk that LFP may become obsolete, which could significantly impact the demand for the project's product.

- **Contract Arrangements:** It is possible that definitive contract arrangements with Aleees will not materialise. This could result in Avenira being unable to use the LFP technology, which is critical to the project. If Avenira is unable to secure an executed licencing arrangement with Aleees it may need to seek out alternative technology providers. This would significantly impair the project's timeline and the company's strategic objectives.

10.2 Delivery Risk

- **Supplier Dependence:** The LFP Project is reliant upon stable access to critical minerals, reagents and mechanical equipment. There is a risk that these supplies might not be available or deliverable in the quality or quantities required for the plant. Supply chain disruptions could cause significant operational challenges for the project including cost overruns and lower than expected production volumes.

- **Capacity to Execute:** Failure to meet key development milestones, including securing appropriate land and regulatory approvals could significantly curtail the timing and commercial feasibility of the project.

- **Operational Risk:** The plant includes multiple interdependent process that must work together seamlessly in order to function as intended. Failures in day-to-day operations may occur as a result of equipment malfunctions, process bottlenecks and mechanical issues. Such disruptions could lead to delays, increased costs and damages to the plant.

- **Environmental Approvals:** The LFP Project requires multiple environmental permits and approvals at the Territory level. These approvals include, but are not limited to, environmental impact assessments and infrastructure approvals. Inability to secure necessary approvals could delay or completely stop the project's development.

- **Land Access:** Avenira requires a large block of land to construct the LFP plant, and the project is contingent on securing a lease agreement with the Northern Territory Government and the Land Development Council. Failure to secure suitable land could lead to delays or

potentially cancellation of the project. Even if a lease is secured, the terms and conditions of the lease could pose additional risks to the project. For instance, the cost of the lease may be higher than anticipated, or the lease may include restrictions on the type of activities that can be undertaken on the land.

- **Labour Market:** The LFP Project requires skilled workers. Shortages of qualified workers or difficulties in attracting and retaining talented workers could negatively impact the projects commissioning and operational performance.

10.3 Financial Risk

- **Access to Capital:** Without access to sufficient equity or debt capital, the project may not be able to progress through its various stages, resulting in delays or, in the worst-case scenario, abandonment of the project. The project's ability to secure financing or raise funds will be subject to market conditions. Movements in capital markets may have a material outcome on the ability of Avenira to fund the LFP Project.

- **Demand:** Demand for LFP batteries may not grow as expected as a result of new innovative battery chemistries taking greater market share. This could constrain the ability of Avenira to identify customers for its product, impacting the financial performance of the LFP Project.

- **Commodity Movements:** Due to the cost-plus fixed percentage pricing structure, the economics of the project exhibit extreme sensitivity to movements in the raw materials required for the manufacture of LFP CAM. The price forecasts used in the Scoping Study may not materialise as expected. This could have an adverse reaction on the project.

- **Offtake Contracts:** There is no assurance that customers will enter into offtake contracts for the supply of LFP CAM from Avenira. This would have a negative impact on the project, curtailing the ability of Avenira to sell its product and generate shareholder revenues. In addition, there is no assurance that Avenira will be able to enter into offtake arrangements for the supply of raw materials required to produce LFP CAM.

- **Excess Supply:** Due to the market's shift in preference towards LFP cathode, there are a large number of overseas plants set to come online over the next few years. This could lead to lower prices, reduced margins, and decreased demand for Avenira's product. Additionally, if Avenira's production capacity is not in line with market demand, it could result in excess supply and lower prices than envisaged in the financial analysis within the Scoping Study.

- **Currency Exposure:** The LFP Project's revenue and cost base may be derived from multiple foreign denominated currencies. This could expose Avenira's financial performance to movements in exchange rates.