

## FIREBIRD TO DEVELOP LITHIUM MANGANESE RICH (LMR) CATHODE FOR SOLID-STATE BATTERIES

### HIGHLIGHTS

- Firebird is expanding its manganese battery chemicals platform to include the development of Lithium Manganese Rich (LMR) cathode materials, targeting next-generation solid-state battery applications.
- Leveraging its industry-leading expertise in High Purity Manganese Sulphate Monohydrate (HPMSM), Firebird will independently develop LMR cathode technology through its internal R&D team and specialist consultants.
- Firebird possesses proprietary and highly efficient processing technology, combining an energy-saving kiln and fifth-generation crystallisation process, enabling the production of a full suite of manganese-based battery chemicals, including:
  - HPMSM, battery-grade  $\text{Mn}_3\text{O}_4$  and  $\text{MnCO}_3$ , which are used in current Li-ion batteries.
  - Manganese Iron Phosphate (MFP) using a newly developed co-synthesis method, delivering superior performance and lower cost for the growing Lithium Manganese Iron Phosphate (LMFP) market.
- Major automakers Ford and GM have both announced LMR as a key cathode for next-generation EVs—Ford (Apr 2025) and GM with LG (May 2025) are both targeting production by the end of the decade.
- In addition to strong EV demand, LMR development is being accelerated by emerging high-energy applications such as eVTOL (electric vertical take-off and landing aircraft) and humanoid robotics, which require energy densities above 300 Wh/kg. With its high specific capacity and working voltage, LMR is uniquely suited to meet these performance demands
- The LMR development program is expected to be completed within 18 months, further strengthening Firebird's vertically integrated innovation platform and solidifying its position as a comprehensive supplier of manganese chemicals for both Li-ion and Na-ion battery markets.



Images 1 and 2: eVOLT & humanoid robot examples (for illustrative purposes).

**Firebird Managing Director, Mr Peter Allen, commented:** *"Firebird continues to recognise the strategic importance of manganese-rich cathode chemistries, which are rapidly emerging as a dominant force in the global battery market. We are taking clear and deliberate steps to position ourselves as a leader in this transition."*

*"We anticipated this shift early and have spent the past several years building a strong foundation—first by establishing our leadership in High-Purity Manganese Sulphate (HPMSM) technology and processing, then by advancing our LMFP cathode material capabilities in partnership with Central South University, a global leader in battery innovation."*

*"This new move to develop Lithium Manganese Rich (LMR) cathode technology significantly enhances our technical capabilities and adds another strategic pillar to our vertically integrated platform—reinforcing Firebird's position at the forefront of next-generation manganese battery materials."*

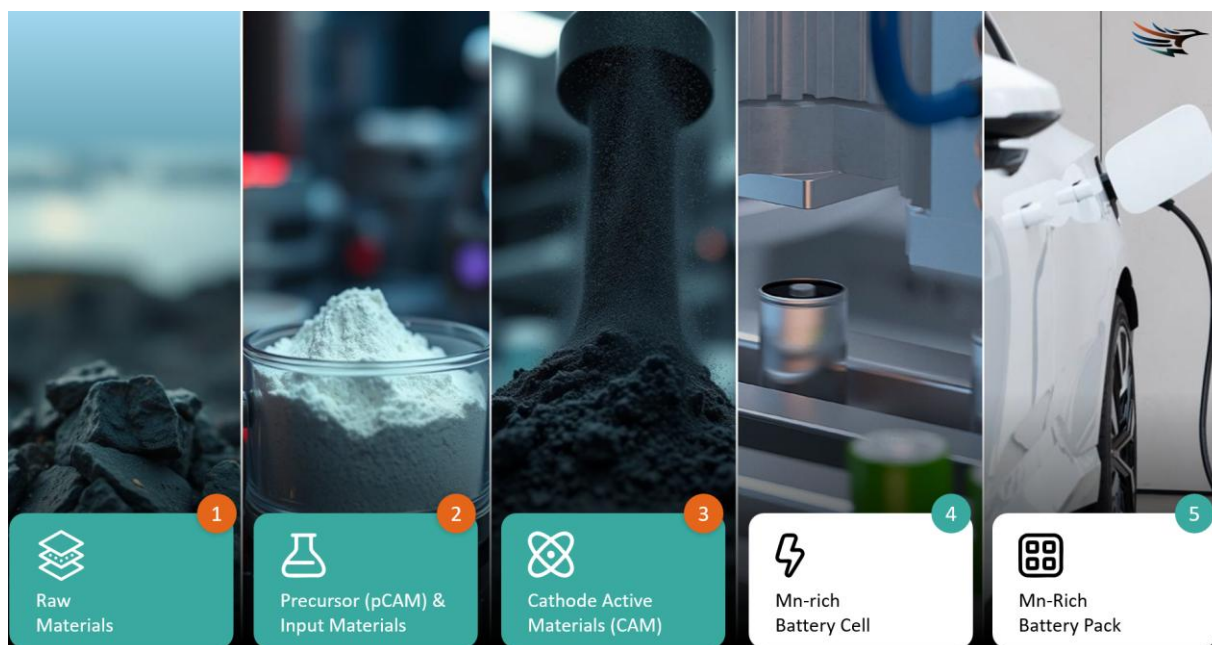


Image 3: Simplified steps in Manganese Rich process, with steps 1 to 3 being Firebird's area of focus.

**Australian-owned Firebird Metals Limited (ASX: FRB, Firebird or the Company)** is pleased to announce the commencement of in-house development of Lithium Manganese Rich (LMR) cathode materials. This program will be led by Firebird's internal technical team, supported by specialist consultants, and undertaken at the Company's R&D Centre. With minimal new equipment required, the initiative can be executed rapidly and with strong capital efficiency.

This development marks a significant milestone in advancing Firebird's vertically integrated strategy—from ore to precursor to cathode—which remains a core differentiator as the Company positions itself to become a low-cost, globally competitive producer of manganese-based battery materials.

Momentum for manganese-rich cathodes continues to build across global battery markets, driven by the growing demand for safer, more cost-effective, and higher-performance alternatives. Lithium Manganese Iron Phosphate (LMFP) has emerged as a leading candidate for mass-market adoption in EV and energy storage sectors. According to Soochow Securities, LMFP is projected to replace 50% of current LFP usage by 2030, representing a market opportunity exceeding US\$20

billion. As a key input to this transition, MFP precursor materials will be essential—an area in which Firebird is strongly positioned through its advanced HPMSM and MFP production capabilities.

Firebird's entry into LMR cathode development builds on this foundation and represents a strategic expansion of its innovation platform. LMR has been identified by global automotive leaders—including GM and Ford—as a critical material for next-generation EV platforms, with commercialisation anticipated later this decade. Furthermore, LMR is considered one of the most promising chemistries for emerging solid-state and semi-solid-state battery technologies.

In addition to EVs, LMR is gaining attention in next-generation high-energy applications such as eVTOL aircraft and humanoid robotics, where energy density requirements exceed 300 Wh/kg. With its high specific capacity and elevated working voltage, LMR is uniquely suited to meet these demanding performance thresholds.

The LMR development program is expected to be completed within 18 months, further enhancing Firebird's vertically integrated innovation platform and reinforcing its position as a comprehensive supplier of manganese-based materials for both lithium-ion and sodium-ion battery markets.

Firebird's long-term objective is to deliver fully integrated processing solutions for manganese-rich cathode materials. With R&D and early-stage production anchored in China—the global hub of battery innovation—the Company intends to replicate its success in Western markets by deploying proprietary technology and establishing localised production capacity.

**This announcement has been approved for release by the Board.**

**For further information contact:**

**Mr Peter Allen**  
**Managing Director**  
+61 8 6245 9818  
[admin@firebirdmetals.com.au](mailto:admin@firebirdmetals.com.au)

## About Firebird Metals Limited

Firebird Metals is an advanced manganese developer focused on combining mining and downstream processing with a dedication to the advancement of the EV battery sector.

The Company is currently progressing its unique China-focused lithium manganese iron phosphate (LMFP) battery strategy, which will develop Firebird into a near-term producer of high-purity, battery-grade manganese sulphate, a key cathode material in LMFP batteries for electric vehicles.

Execution of this strategy will place Firebird at the forefront of manganese sulphate production, at a time when the use and demand for manganese in batteries continues to rapidly grow. Due to the low number of ASX-manganese developers and increasing use of LMFP by car manufacturers, Firebird is in a strong position to benefit from this growing market and deliver significant value to its shareholder base.

The Company also has a project portfolio located in the renowned East Pilbara manganese province of Western Australia, which boasts a total Resource of 234Mt<sup>1,2</sup>, with exciting exploration and development growth upside. The portfolio is led by the flagship Oakover Project, which holds a Mineral Resource Estimate of 176.7 Mt at 9.9% Mn, with 105.8 Mt at 10.1% Mn in an Indicated category.

The Company's other key project is Hill 616 which provides Firebird with a compelling growth opportunity. Hill 616 contains an Inferred Mineral Resource of 57.5Mt at 12.2% Mn and shares similar geological traits to Oakover.

The Company is committed to generating sustainable long-term value and growth for stakeholders, through the implementation of best practice exploration methods while prioritising the well-being, health and environmental protection of its employees and communities it operates in.

## JORC Compliance Statement

This announcement contains references to Mineral Resource Estimates, which have been reported in compliance with Listing Rule 5.8 and extracted from previous ASX announcements as referenced.

The Company confirms that it is not aware of any new information or data that materially affects the information previously reported and that all material assumptions and technical parameters underpinning the Mineral Resource Estimates continue to apply and have not materially changed.

---

<sup>1</sup> See ASX announcement dated 23 March 2023: Indicated Resource of 105.8Mt at 10.1%; Inferred Resource of 70.9Mt at 9.6% for global Resource of 176.7 Mt at 9.9% Mn.

<sup>2</sup> See ASX announcement dated 1 December 2021: Inferred Resource of 57.5 Mt at 12.2% Mn.