

## HPMSM Feasibility Progressing on Schedule for 2022 Delivery

### USA Inflation Reduction Act sparks interest from potential offtake/financing partners in a USA based location

#### Flowsheet Completion

- Completing a **Feasibility Study** into the production of battery grade **HPMSM** from Element 25 concentrate targeting the expanding lithium-ion battery market.
- Proprietary Element 25 process reliably generates battery grade **HPMSM** product with industry endorsement from multiple potential offtake partners.
- **Pilot scale test programme** being finalised in North American test facilities as final confirmation of flowsheet parameters for engineering design.
- High quality product and **reduced carbon footprint** provides for “future-proofing” against increasingly high purity requirements as battery technologies evolve.

#### Project Location

- “Design one – build many” (DOB) to facilitate multiple build sites and minimise localisation requirements.
- Sarawak **Malaysia** remains an attractive location and is the base case for the current Feasibility Study.
- Inflation Reduction Act (IRA) in the USA has generated strong interest for a USA based facility. Advanced discussions with multiple potential offtake and financing partners support potential for a USA based facility.
- Inflation Reduction Act provides **strong incentives** for USA and FTA country supply chains for USA EVs<sup>1</sup>.
- Australian sourced HPMSM meets the requirements of the IRA for vehicle manufacturers to attract USA federal subsidies and is creating strong interest from potential customers with a **USA EV or EV battery market presence**.
- Element 25 currently running the USA location in parallel with Malaysia in response to strong interest from offtake/finance partners.
- Executive site visit to the USA confirms Louisiana as a favourable location for a USA based HPMSM plant.
- Engagement with Louisiana Economic Development, Baton Rouge Area Chamber and local industry confirms local support for a Louisiana site, which is also supported by discussions with potential offtake/finance partners.



<sup>1</sup> Reference: <https://www.dlapiper.com/en/us/insights/publications/2022/08/inflation-reduction-act-seeks-to-jumpstart-electric-vehicle-market/>

## COMPANY SNAPSHOT

#### Market Summary

ASX code:	E25
Shares on issue:	153M
Share price:	\$0.725

#### Board of Directors:

Seamus Cornelius	Chairman
Justin Brown	MD
John Ribbons	NED

Element 25 Limited is developing the world class Butcherbird Manganese Project in Western Australia to produce high quality manganese concentrate and high purity manganese products for traditional and new energy markets.

**Offtake and Marketing**

- Discussions ongoing with potential offtake partners to provide long term HPMSM supply and price security for electric vehicle and battery manufacturers.
- Multiple parallel offtake negotiations underway and scheduled for substantial finalisation before year end 2022.

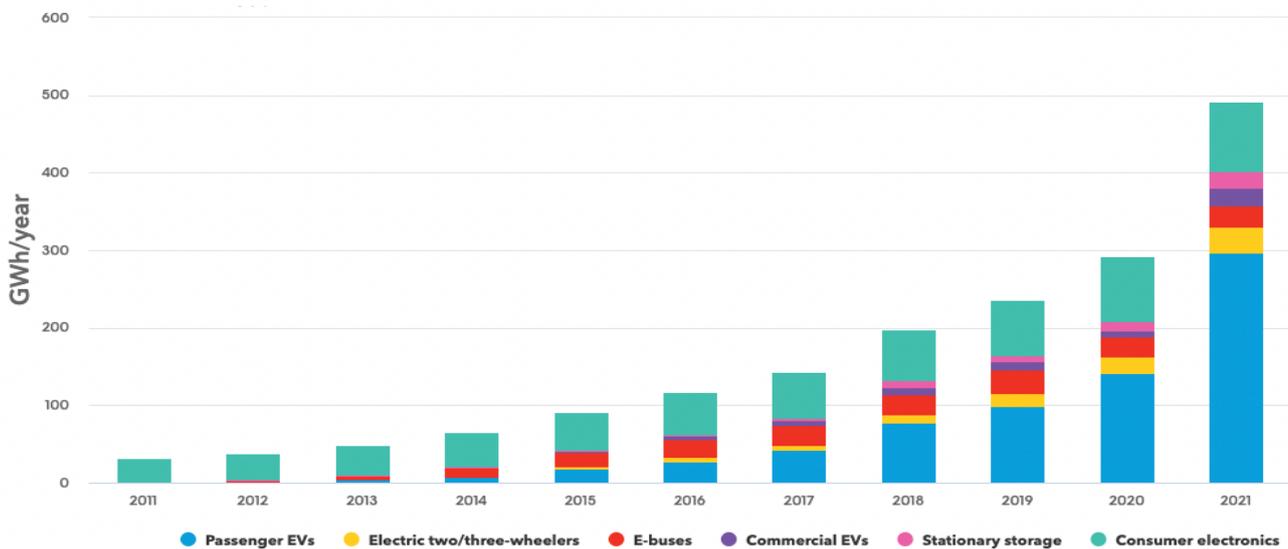
**Project Financing**

- Element 25 pursuing a combined offtake/financing solution with Original Equipment Manufacturers (OEM) and cathode manufacturers to provide substantial project funding.
- Project offtake and financing strategies scheduled to be finalised in line with FS completion in December 2022.

Element 25 Limited (E25 or Company) (ASX:E25) is pleased to provide an update with respect to the planned production of high purity battery grade manganese sulphate monohydrate (HPMSM) from manganese oxide concentrates currently produced at the Company’s 100% owned Butcherbird Project (Project).

Several locations are being investigated in line with the Company’s ambition to develop multiple processing location over time to serve the rapidly expanding lithium-ion battery material markets in different geographic regions with a particular short-term focus on Asia and North America.

**Annual lithium-ion battery demand by application**



Source: BNEF.

Important macro-economic and geopolitical influences support the business case for HPMSM production from an Australian manganese source including widespread efforts to electrify the global vehicle fleet, as well as supply chain ESG considerations which require more scrutiny on material provenance and a move towards diversifying the source of supply of critical minerals.

HPMSM is the highest purity “battery grade” manganese chemical used in lithium-ion batteries and demand for this specialty material is expected to grow rapidly in coming years<sup>2</sup> in line with the growth in production of Electric Vehicles (EV’s) and sustainable and ethical considerations will, in the opinion of the Company’s board, become an increasingly important factor in sourcing strategies across the globe.

### Feasibility Study Overview

The Feasibility Study (FS) remains on schedule for completion in December 2022. Vendor pricing and approximate lead times have been received for all major packages with the preliminary numbers for the project capital cost estimate in line with company expectations<sup>3</sup>.

Ongoing engagement with project engineers and third-party consultants has progressively improved layout and equipment selection with consequent cost optimisation. Decisions around layout and overall design continue to be optimised to align with the DOBM engineering philosophy.

Each HPMSM production module is currently designed with a nameplate production capacity of 65Kt per annum of battery grade HPMSM requiring circa 75Kt per annum of Butcherbird manganese concentrate as the principal feedstock.

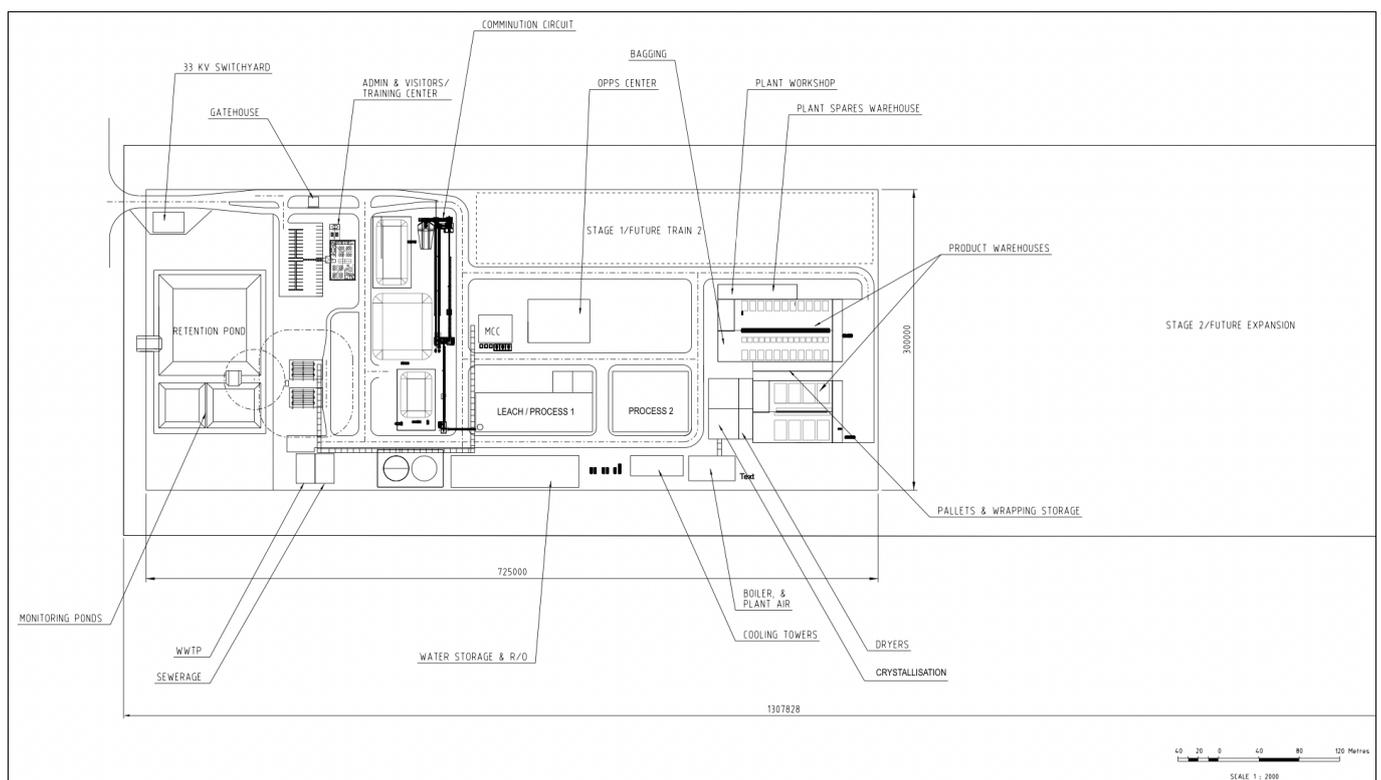


Figure 1. HPMSM processing facility site layout plan.

<sup>2</sup> Reference: <https://about.bnef.com/electric-vehicle-outlook/>

<sup>3</sup> Reference: <https://www.element25.com.au/site/pdf/634d3046-2a69-447e-a1ff-765e6b1a48f7/Scoping-Study-HPMSM-Conversion-Plant-Economics.pdf>

## Flowsheet Development

### Pilot Scale Test programmes

The Element 25 process flowsheet offers several advantages over existing HPMSM production technologies including reduced reagent consumption and a near zero solid waste footprint due to the production of co-products which can be utilised in complementary processes including the cement, fertiliser and ferro alloy industries.

Process design for the HPMSM facility is largely complete with final metallurgical confirmation of the proprietary Element 25 flowsheet to be based around bulk trials of key purification and crystallisation processes.

The pilot scale test programmes are currently being undertaken in two world class North American test facilities.

The purification and crystallisation programmes are both designed as a final validation of the process parameters but importantly will provide important analytical data to underpin the final design of key processing components from an engineering and project delivery perspective.

In each case the test programmes are being conducted in conjunction with input from preferred equipment manufacturers/vendors to ensure that the transition from feasibility to detailed engineering is as seamless as possible to support the stated project execution timelines for the project.

The test programmes are scheduled for completion by the end of the month and the results will inform the final inputs into the FS deliverables for both capital and operating cost estimates. The programme will also produce sizeable samples for offtake qualification purposes.

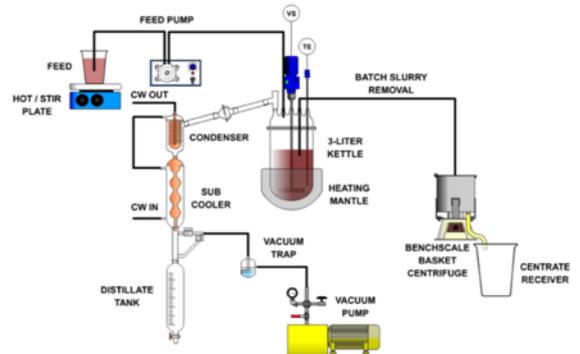


Figure 2. Schematic crystallisation bulk test programme flowsheet design.

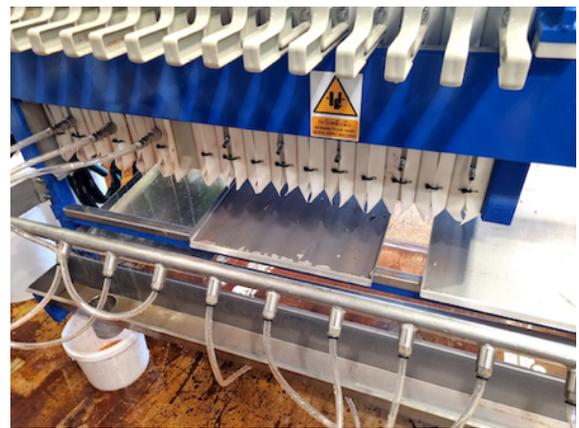


Figure 3. Laboratory test equipment in operation.



Figure 4. Element 25 HPMSM crystalline product.

## Offtake/Marketing Update

### The impact of the Inflation Reduction Act<sup>4</sup>

The Inflation Reduction Act, (IRA) passed in the USA congress in August 2022 will inject hundreds of billions of dollars into clean energy and EV incentives and programs. A number of the provisions of the IRA directly impact EV supply chains including the HPMSM used in the manufacture of EV batteries.

Importantly, to qualify for certain incentives, a percentage of the value of applicable critical minerals contained in a vehicle's batteries must be extracted or processed in the US or in a country with which the US has a **free trade agreement (FTA)** (or must have been recycled in North America). Applicable percentages increase from 40 percent prior to 2024, to 80 percent after 2026.

Also significantly, after calendar year 2024, the incentives will not be available for EVs that contain critical minerals that were "extracted, processed, or recycled by a foreign entity of concern" – including companies owned by, controlled by or subject to the jurisdiction of the government of the People's Republic of China.

Importantly for Element 25 investors, qualifying FTA countries include **Australia** and qualifying critical minerals include **manganese**, placing the Butcherbird Project and the Element 25 HPMSM technology in an excellent position to supply US based EV market supply chains in coming years whilst allowing our partners to maintain eligibility for the incentives offered under the IRA scheme.

### Offtake/Financing Negotiations

Element 25 has been engaged in constructive discussions with a number of potential offtake partners in relation to the supply of HPMSM using the Element 25 process to satisfy potential growth in demand for HPMSM in lithium-ion battery cathodes for EVs.

Counterparties to these discussions, aimed at securing binding supply agreements with high quality project partners, have included electric vehicle OEMs as well as established cathode and precursor material manufacturers. The discussions have also been focussed on combining offtake, pricing and finance outcomes to bring certainty to project delivery and, in turn, provide supply and pricing certainty to customers.

These discussions are progressing well and in line with stated project timelines, the Company anticipates being in a position to announce binding agreement(s) in the near future.

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<sup>4</sup> Reference: <https://www.dlapiper.com/en/us/insights/publications/2022/08/inflation-reduction-act-seeks-to-jumpstart-electric-vehicle-market/>

## Project Location

The FS is examining the potential to design a location agnostic conversion facility which can potentially be built in multiple locations to match growing demand from the battery industry, with a “design one – build many” (DOB) philosophy.

### Location Option 1 - Samalaju Industrial Park Malaysia

The FS is undertaking location specific investigations into the suitability of a Malaysian location for the first of the proposed HPMSM conversion facilities. The Samalaju Industrial Park located in Sarawak Malaysia is the base case for the FS activities.

Sarawak Malaysia was identified early in the process as a favourable location for the development of a HPMSM facility due to a number of advantages including:

- Logistics infrastructure.
- Relative cost advantages over an Australian construction location.
- Attractive federal and state incentives.
- Proximal access to reagents.
- Access to co-product customers which allows a near zero solid waste process flow.

Within the Samalaju location, a preferred site has been identified and a land application has been submitted. Once this is approved, formal applications for various incentive packages will be submitted to the Malaysian Industrial Development Authority (MIDA) as well as to local Sarawak State regulators.



Figure 5. Samalaju Industrial Park - established port facilities including established bulk manganese import capability.

### Location Option 2 - Louisiana USA

The passing of the IRA in the USA has had a strong positive impact on the level of interest from both potential offtake and financing partners to construct a HPMSM production facility in the USA to take advantage of federal government incentives for a USA based EV supply chain including battery material inputs.

Louisiana has been identified as a favourable location for the development of a HPMSM facility due to several advantages including:

- Logistics infrastructure.
- Relative cost advantages over an Australian construction location.
- Proximal access to reagents and complementary chemical installations.
- Satisfaction of the IRA requirements for US based EV supply chains to attract local offtake/finance partners.
- Availability of land and rapid permitting for pre-approved sites.
- Access to co-product customers which supports a near zero solid waste process flow.
- Skilled labour availability.

Along with the benefit of past local experience in Louisiana within the E25 Project executive, a site visit was undertaken in September 2022 to commence engagement with local stakeholders. The site visit confirmed Louisiana as a preferred location for a HPMSM processing facility with strong local support and favourable local infrastructure and reagent supply chains. Work will now continue on these preliminary works and once offtake and financing agreements are finalised with support for a Louisiana location, work will commence in earnest on this development option.



Figure 6. Established industries in Louisiana offer synergies for reagents, power and other inputs.



Figure 7. The Mississippi River provides inbound and outbound logistics access to US markets.



Figure 8. Initial engagement with local stakeholders indicates support for a Louisiana facility.



Figure 9. Element 25 is evaluating a USA based option supported by USA offtake and financing in response to the IRA legislation.

## Project Team Focus

E25’s Operations team continues to focus on delivering sustained nameplate production. The Business Development team is focussing on E25’s multi-stage development strategy, including a Stage 2 expansion of the concentrate business in parallel with the Stage 3 development of a conversion facility to convert the concentrate material into HPMSM for EV batteries to power the global transition away from fossil fuel powered mobility.

Manganese is emerging as an increasingly important ingredient for EV batteries, with potential supply constraints for nickel and cobalt forcing battery manufacturers to look to high manganese cathodes to produce the vast amount of cathode material required by the EV industry in coming years<sup>5</sup>.

<sup>5</sup> <https://thenextavenue.com/2021/01/22/svolt-opens-orders-for-its-nmx-nickel-manganese-batteries/>

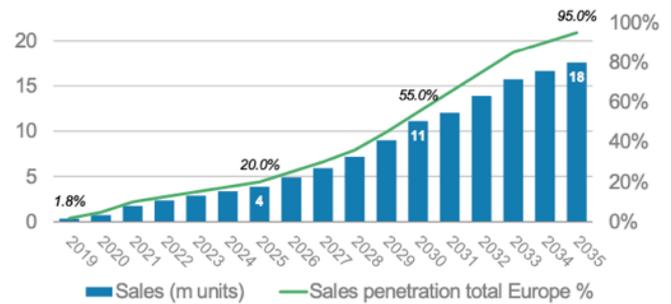
The Project is ideally placed to feed this potential demand, with **advanced flowsheet development** work undertaken in 2019 and 2020 confirming a simple leach process for E25 ores which, when combined with offsets, will target the world’s first **Zero Carbon Manganese** for EV cathode manufacture<sup>6</sup>.

The Company released a Scoping Study (**Study**) in January 2022<sup>7</sup> to update the market prior to the release of the Feasibility Study (**FS**) which is currently being completed.

### Battery EV Penetration Rate Forecast to Increase

As battery electric vehicle (BEV) makers seek to increase the uptake of electric vehicles, one commercial driver is cost reduction. VW's Power Day suggested a 50% cost reduction for batteries with cell design (-15%), production process (-10%), **cathode/anode materials (-20%)** and battery systems (-5%) driving the change.

Global BEV penetration is expected to rise to 15.2% by 2025 and 39.5% in 2030 – led by Europe and China, according to Morgan Stanley’s latest report<sup>8</sup>. The main driver in the cathode materials is a shift to a high manganese cathode material for the volume production, which is expected to underpin strong demand growth for battery-grade manganese sulphate. Current estimates put demand by 2030 at 13 times current supply and a deficit of 1.3Mt even factoring in planned supply increases<sup>9</sup>.



Source: ACEA, Morgan Stanley Research estimates

Table 1. Europe BEV sales volumes (m) and penetration (%)

### About the Butcherbird Manganese Project

E25’s Butcherbird Manganese Project is a world-class manganese resource with current JORC resources of more than 260Mt of manganese ore<sup>10</sup>. The Project straddles the Great Northern Highway and the Goldfields Gas Pipeline, providing turnkey logistics and energy solutions. The Company plans to integrate renewable energy into the power solution over time to target a zero-carbon footprint for the Project, which is expected to also reduce energy costs. A cleaner, lower carbon flowsheet and high penetration renewable energy will place Butcherbird at the forefront of sustainable high purity manganese production.

<sup>6</sup> Reference: Company ASX release dated 12 February 2019

<sup>7</sup> Reference: Company ASX release dated 18 January 2022

<sup>8</sup> Morgan Stanley Research published 3 September 2021

<sup>9</sup> Euromanganese company presentation dated September 2021

<sup>10</sup> Reference: Company ASX release dated 17 April 2019.

## Mineral Resources

Category	Tonnes (Mt)	Mn (%)	Si (%)	Fe (%)	Al (%)
Measured	16	11.6	20.6	11.7	5.7
Indicated	41	10.0	20.9	11.0	5.8
Inferred	206	9.8	20.8	11.4	5.9
<b>Total</b>	<b>263</b>	<b>10.0</b>	<b>20.8</b>	<b>11.4</b>	<b>5.9</b>

Notes:

- Reported at a 7% Mn cut-off for the Measured and Indicated categories and an 8% Mn cut-off for the Inferred categories.
- All figures rounded to reflect the appropriate level of confidence (apparent differences may occur due to rounding)

## Mining Reserve

Based on the results of the Pre-Feasibility Study completed in May 2020, E25 has published a Maiden Ore Reserve for the Project of 50.55Mt in the Proved and Probable categories<sup>11</sup>.

Classification	Tonnes (Mt)	Grade (Mn%)	Contained Mn (Mt)	Recovered Mn (Mt)
Proved	14.4	11.5	1.65	1.35
Probable	36.2	9.8	3.56	2.92
<b>Total</b>	<b>50.6</b>	<b>10.3</b>	<b>5.21</b>	<b>4.27</b>

Justin Brown

Managing Director

Company information, ASX announcements, investor presentations, corporate videos and other investor material in the Company's projects can be viewed at: <http://www.element25.com.au>.

## Competent Persons Statement

The company confirms that in the case of estimates of Mineral Resource or Ore Reserves, all material assumptions and technical parameters underpinning the estimates in the market announcements dated 17 April 2019 and 19 May 2020 continue to apply and have not materially changed. The company confirms that the form and context in which the competent person's findings are presented has not been materially modified from the original market announcements.

The information in this report that relates to Exploration Results and Exploration Targets is based on information compiled by Mr Justin Brown who is a member of the Australasian Institute of Mining and Metallurgy. At the time that the Exploration Results and Exploration Targets were compiled, Mr Brown was an employee of Element 25 Limited. Mr Brown is a geologist and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Brown consents to the inclusion of this information in the form and context in which it appears in this report.

This announcement is authorised for market release by Element 25 Limited's Board of Directors.

<sup>11</sup> Reference: Element 25 Limited Reserve Statement lodged with ASX 19 May 2020.