

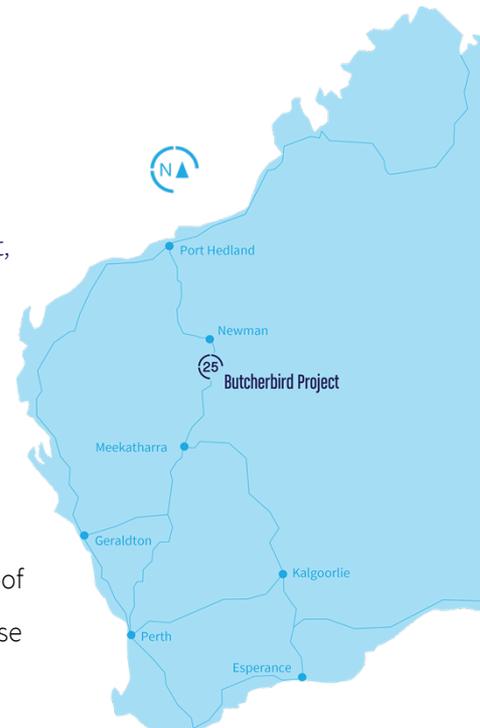
## Element 25 Granted Patent for High Purity Manganese Process

- E25 granted Innovation Patent for rapid atmospheric manganese extraction.
- Patent granted for an eight-year term.
- Test programme utilising run-of-mine concentrate from E25's Butcherbird Project, which is the planned feed for the commercial conversion facility.
- E25 is continuing flowsheet optimisation test work to further reduce reagent cost and carbon intensity.
- Recoveries of up to 97% Mn achieved, with further optimisation planned.

Element 25 Limited (E25 or Company) (ASX:E25) is pleased to confirm the grant of an **Innovation Patent** for a flowsheet<sup>1</sup> it designed for the extraction of manganese from run-of-mine concentrate from the Company's 100%-owned, world-class Butcherbird Manganese operation in Western Australia (Project).

The patent is based on a process-proven ambient temperature and atmospheric pressure leach with multiple rounds of testing successfully leaching Project ores to produce a manganese sulphate solution, achieving high recoveries and excellent selectivity against undesirable impurities. This solution is further processed to produce battery-grade High Purity Manganese Sulphate Monohydrate (HPMSM) for the manufacture of lithium-ion batteries for electric vehicles (EV).

As previously announced, recent test work confirmed **high extraction rates of up to 97%** in under 60 minutes, with the bulk of the extraction taking place in the **first 15 minutes of the reaction**. Importantly, this round of extraction tests utilised an alternative reagent offering advantages over that used previously in terms of availability, cost, process simplification and carbon intensity, in keeping with the Company's objective of becoming a low cost **Zero Carbon Manganese™** producer.



<sup>1</sup> Reference: Company ASX Release dated 25 August 2021

### COMPANY SNAPSHOT

#### Market Summary

ASX code: E25  
 Shares on issue: 149M  
 Share price: \$2.12

#### 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.

## Project team focus

E25’s Business Development team is focussing on the next stages of the multi-stage development strategy, including a Stage 2 expansion of the concentrate business followed by a Stage 3 development to convert the concentrate material into high purity manganese sulphate monohydrate (HPMSM) for electric vehicle (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>2</sup>.

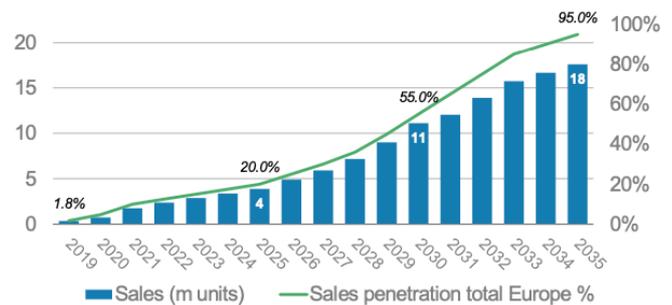
The Project is ideally placed to feed this potential demand, with **advanced flowsheet development** work undertaken in 2019 and 2020 confirming a simple leach process for E25 ores which, when combined with offsets, will target the world’s first **Zero Carbon Manganese™** for EV cathode manufacture<sup>3</sup>.

## Battery EV Penetration Rate Forecast to Increase Further

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>4</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. Estimates put demand by 2030 at 13 times current supply and a deficit of 1.3Mt even factoring in planned supply increases<sup>5</sup>.



Source: ACEA, Morgan Stanley Research estimates

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

<sup>2</sup> <https://thenextavenue.com/2021/01/22/svolt-opens-orders-for-its-nmx-nickel-manganese-batteries/>

<sup>3</sup> Reference: Company ASX release dated 12 February 2019.

<sup>4</sup> Morgan Stanley Research published 3 September 2021

<sup>5</sup> Euromanganese company presentation dated September 2011

## About the Butcherbird Manganese Project

E25's Butcherbird Manganese Project is a world-class manganese resource with current JORC resources of more than 263Mt of manganese ore<sup>6</sup>. In May 2020, the Company completed a Pre-Feasibility Study (PFS)<sup>7</sup> with respect to developing the deposit to produce manganese concentrate for export to generate early cashflow with a modest capital requirement<sup>8</sup>. Stage 1 of the Project development plan is complete and E25 has commenced shipping ore to offtake partners.

The PFS also highlighted the Project's potential for significant growth beyond the initial Stage 1 production volumes (the studies examined the potential for a 2X and 3X expansion to Stage 1 within 12 months of initial commissioning), and the Company expects to expedite the expansion of the Project.

In addition to the concentrate export business, the Company has completed extensive research & development and laboratory test work into the production of high purity manganese products including battery grade manganese sulphate (HPMSM) and High Purity Electrolytic Manganese Metal (HPEMM). The work has highlighted that the Butcherbird ores are highly amenable to an ambient temperature, atmospheric pressure leach process, resulting in a very efficient extraction of the manganese into solution, the key requirement for the cost effective and sustainable production of HPMSM and HPEMM.

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.

### 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)

<sup>6</sup> Reference: Company ASX release dated 17 April 2019.

<sup>7</sup> Reference: Company ASX release dated 19 May 2020.

<sup>8</sup> Reference: Company ASX release dated 3 December 2020

## 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>9</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>9</sup> Reference: Element 25 Limited Reserve Statement lodged with ASX 19 May 2020.