



# High Reactivity Metakaolin (HRM) for low-carbon concrete

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September 2024

ASX: ZEO  
[www.zeotech.com.au](http://www.zeotech.com.au)



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## ASX Listing Rule 5.23

The information in this presentation relating to exploration results for the Toondoon Project is extracted from the following announcements entitled ‘ZEO Acquires High-Grade Kaolin Project within Approved ML’ released to the ASX on 23 August 2021, ‘Notice of General Meeting/Proxy Form (Part 2 of 2) Ausrocks Mineral Estimates Report’ released to the ASX on 27 July 2022 and ‘Land Purchase Agreements signed Accelerate Toondoon Project’ released on to the ASX on 8 December 2022, which are all available on the Company’s website [www.zeotech.com.au](http://www.zeotech.com.au)

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements, and that all material assumptions and technical parameters underpinning the estimates in the original market announcements 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 have not been materially modified from the original market announcements.



# Investment Highlights

## First Mover Advantage



Becoming Australia's first large-scale metakaolin producer. Simple and cost-effective process to leverage Toondoon's kaolin as a competitive Supplementary Cementitious Material (SCM) for the concrete industry

## Climate-Tech Focus



Advancing research and investment in climate tech associated with metakaolin production, soil carbon sequestration, and fugitive methane emissions

## Large-Scale Resource



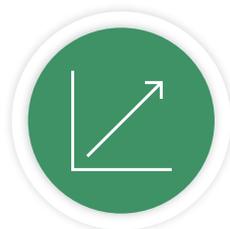
14Mt JORC resource<sup>1</sup> of high-purity kaolin proven to produce high reactivity metakaolin (HRM), contained within only 5% of the tenement footprint

## Near Term



Test pit completed, ready to mine, exceptionally high-grade kaolin resource, held under approved Mining Lease on Company freehold land. Simple HRM circuit with proven conventional equipment

## Large & Growing Market



The global Supplementary Cementitious Materials (SCM) market is forecast to reach US\$39.9 billion by 2030<sup>2</sup>. SCMs are the most viable alternative to mitigate CO<sub>2</sub> emissions from the cement industry<sup>3</sup>

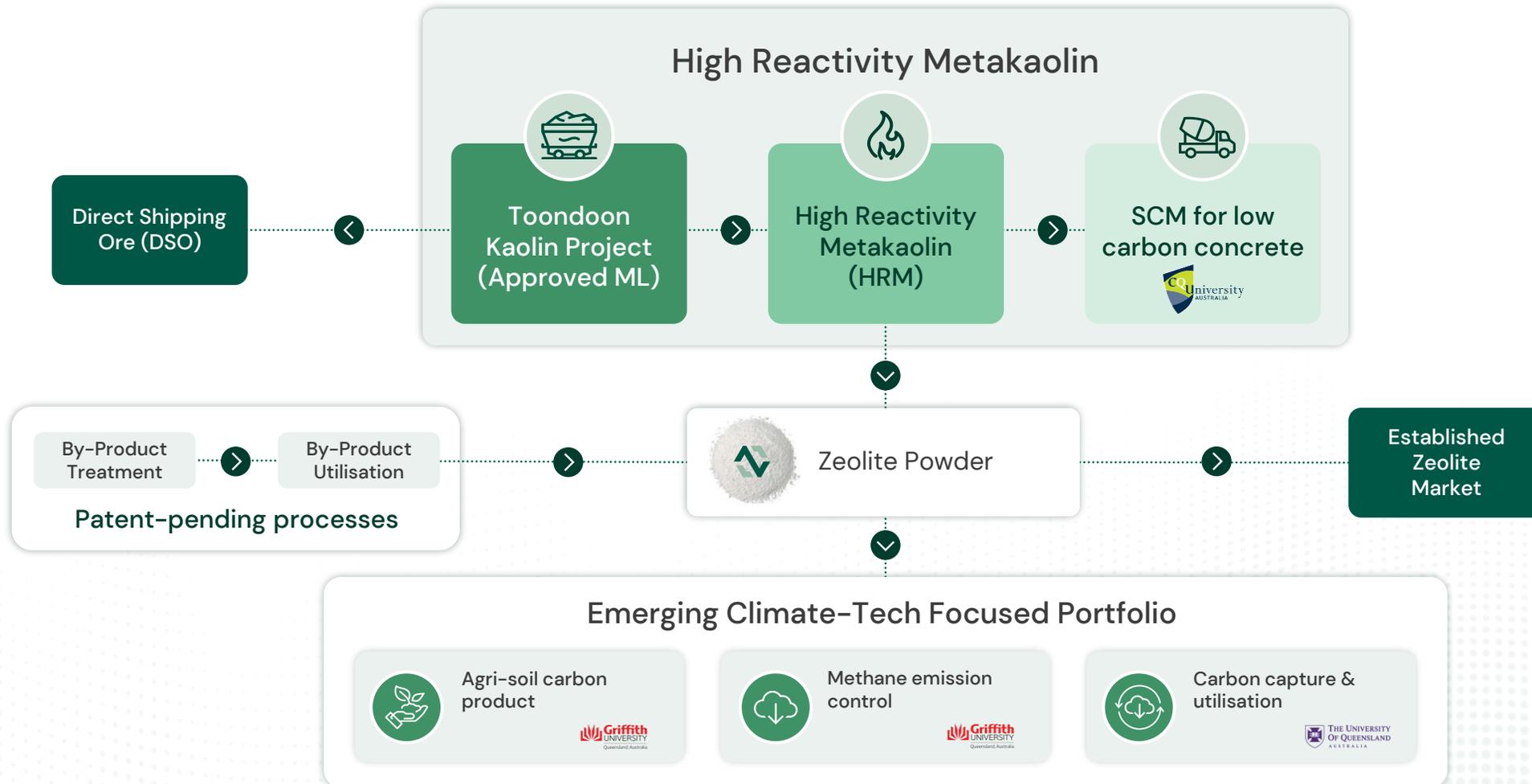
## Collaboration



History of strong industry and local research collaboration. SCM trials completed by Central Queensland University, industry engagement is underway to advance concrete trials, and the Methane Control program is in progress at Griffith University

# Integrated Mineral Processing Tech Company

Advancing 'shovel ready' high-grade kaolin resources and proprietary IP to drive decarbonisation

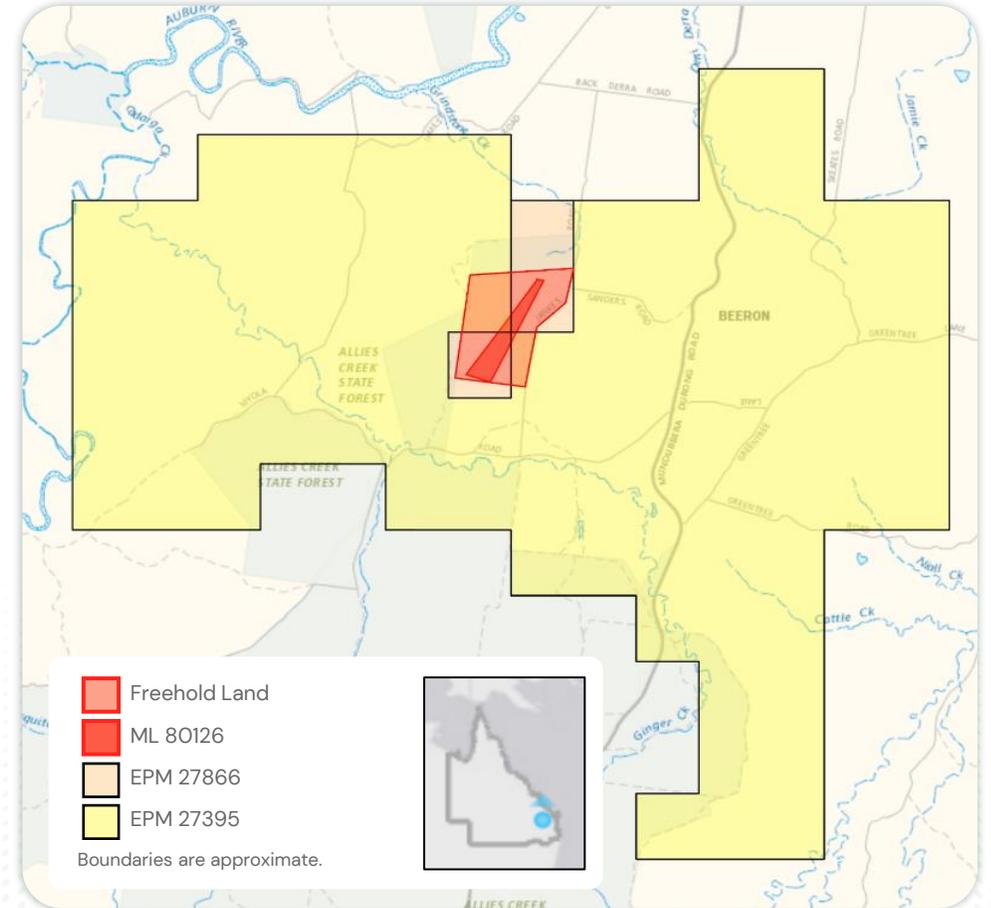


# Toondoon Kaolin Project

One of Australia's highest-grade raw ore kaolin resources held under an approved Mining Lease

- Approved ML (80126) and two granted Exploration Permits for Minerals (EPM 27395 & 27866) covering 28,000ha and ownership of freehold land of approximately 682ha
- JORC delivers 14Mt of kaolin profiles, grading on average >36% alumina within ML, capable of producing a high reactivity metakaolin, contained within only 5% of the Toondoon Project tenement footprint<sup>1</sup>
- Drilling confirms raw kaolin resource purity (c. 80–90% kaolinite) that remains open in all directions<sup>1,2</sup>
- Large-scale mineralised system from the surface, offering simple open-cut mining with minimal overburden
- Favourable logistics (highway for heavy vehicles) affording flexibility to establish a Metakaolin production facility location

Toondoon raw kaolin (screened/milled) produces a high reactivity metakaolin ('HRM') that exceeds the Australian and ASTM International Standards for a manufactured pozzolan



# Market Opportunity

## Legislated emission reduction targets set to drive SCM demand for low carbon concrete

### 8% of Global Emissions

Production and use of cement accounts for ~8% of worldwide CO<sub>2</sub> emissions<sup>1</sup>, and is the binding agent for concrete, the most widely produced and used man-made material.

### Major Addressable Market

Circa 29 million cubic meters of ready-mix concrete are produced annually to build in Australia<sup>2</sup>, offering a material domestic market in addition to APAC exports including New Zealand and Japan

### Lower Decarbonisation Cost

Decarbonisation will add a green premium to concrete and cement. Use of SCMs reduces emissions and reduces costs vs carbon capture, utilisation & storage (CCUS) which is the most expensive among all mitigation solutions<sup>4</sup>

### Superior SCM

Metakaolin is considered a user friendly and superior supplementary cementitious material. It enhances strength, improves durability, and enables better workability.

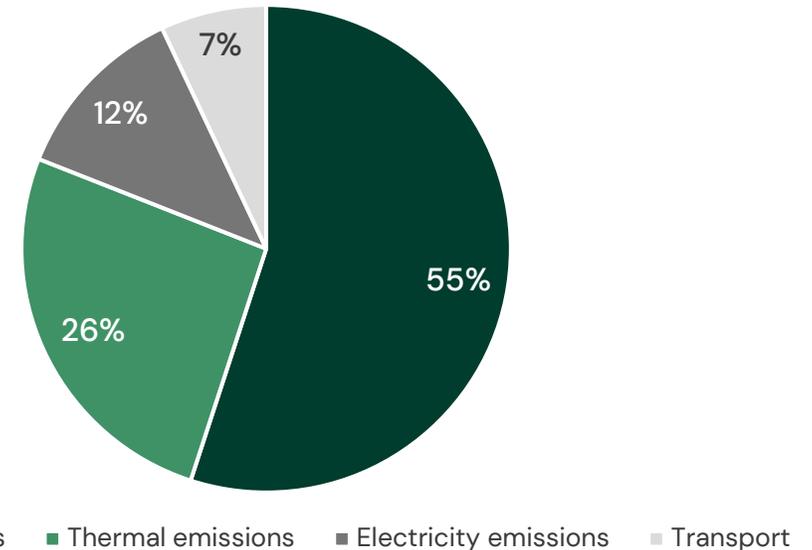
### Accessible Markets

The fastest growing market for SCMs is the Asia-Pacific<sup>3</sup> underpinned by a growing construction industry and large industry participants seeking to reduce their carbon footprint

### Legislated Reduction

Australia's Safeguard Mechanism is the Government's policy for reducing emissions at Australia's largest industrial facilities, which includes the cement industry. The Safeguard sets legislated limits on greenhouse gas emissions that will decline, in general, by 4.9% each year to 2030<sup>5</sup>

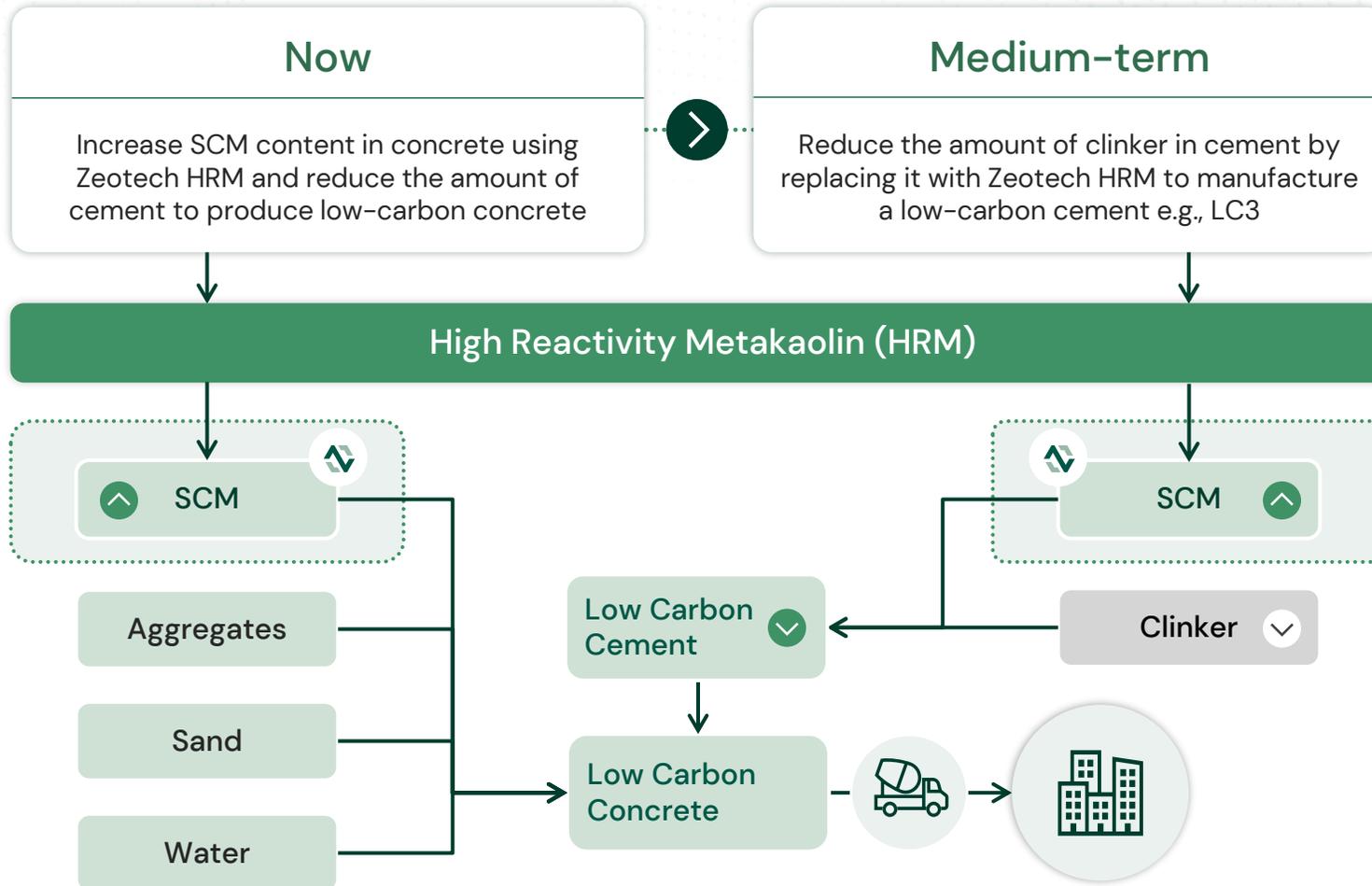
### Cement & Concrete CO<sub>2</sub> Emissions Profile



Over 80% of CO<sub>2</sub> emissions from cement production originate from decarbonation of limestone and fuel-based emissions from heating a kiln at very high temperatures (1,450 degrees)<sup>6</sup>

# Commercial Pathways

## Immediate low-carbon concrete market and medium-term low-carbon cement potential



### What are SCMs?<sup>1</sup>

- Cement and concrete can contain additions known as Supplementary Cementitious Materials (SCMs).
- Industry has long used SCMs such as fly ash (a by-product from coal-combustion power generation), granulated blast furnace slag (a by-product from the steel manufacturing process), or unburnt ground limestone.
- Manufactured pozzolans, such as HRM, are a new SCM with superior properties<sup>2</sup> that make them very useful in cement and concrete.
- SCMs contribute to the cement and concrete performance and at the same time, they can partially replace clinker in cement or can be used in concrete to partially replace cement, thus lowering the CO<sub>2</sub> footprint of both.

# Zeotech High Reactivity Metakaolin Opportunity

Superior SCM to meet low-carbon concrete demand



## Competitive HRM

Toondoon's high-grade raw kaolin (c. 80-90% kaolinite)<sup>1</sup> enables a simple and cost-effective process circuit to produce a competitive HRM

## Exceeds Standards

Toondoon raw kaolin has produced a HRM that exceeds Australian Standards and ASTM International Standards for a manufactured pozzolan<sup>1</sup>

## Industry Demand

Strong industry engagement is evident, with a clear market pathway to commercialisation and adoption as an SCM for concrete, together with long-term growth from the expansion of products and uses

## CapEx Light

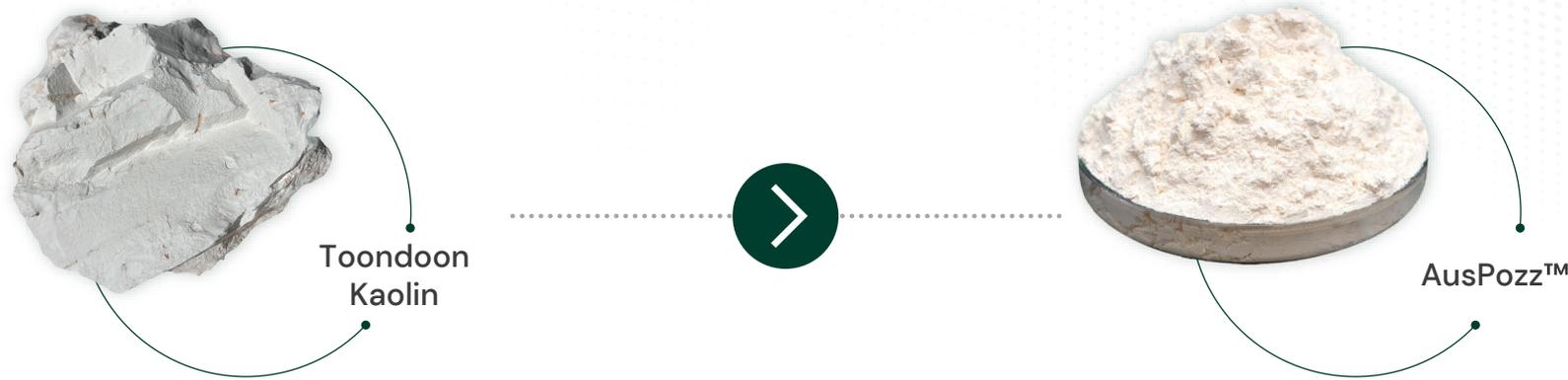
Conventional and proven plant and equipment drives an efficient process circuit that reduces capex and mitigates scale-up risk

## Zeolite Production

Metakaolin is the feedstock for manufactured zeolite production

# High Reactivity Metakaolin Process

High-purity kaolinite feedstock delivers simple and cost-effective HRM production

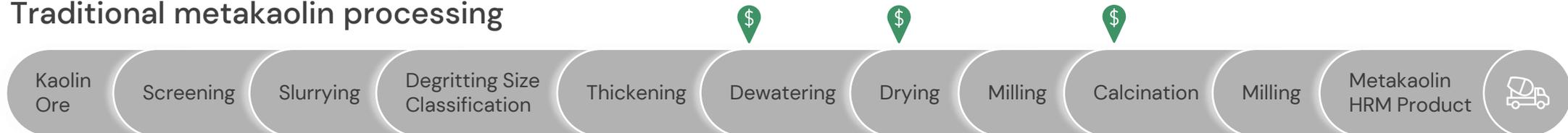


- Lower CapEx
- Time efficient
- Lower OpEx
- Industry demand

## Zeotech's metakaolin processing circuit



## Traditional metakaolin processing



# Product Validation

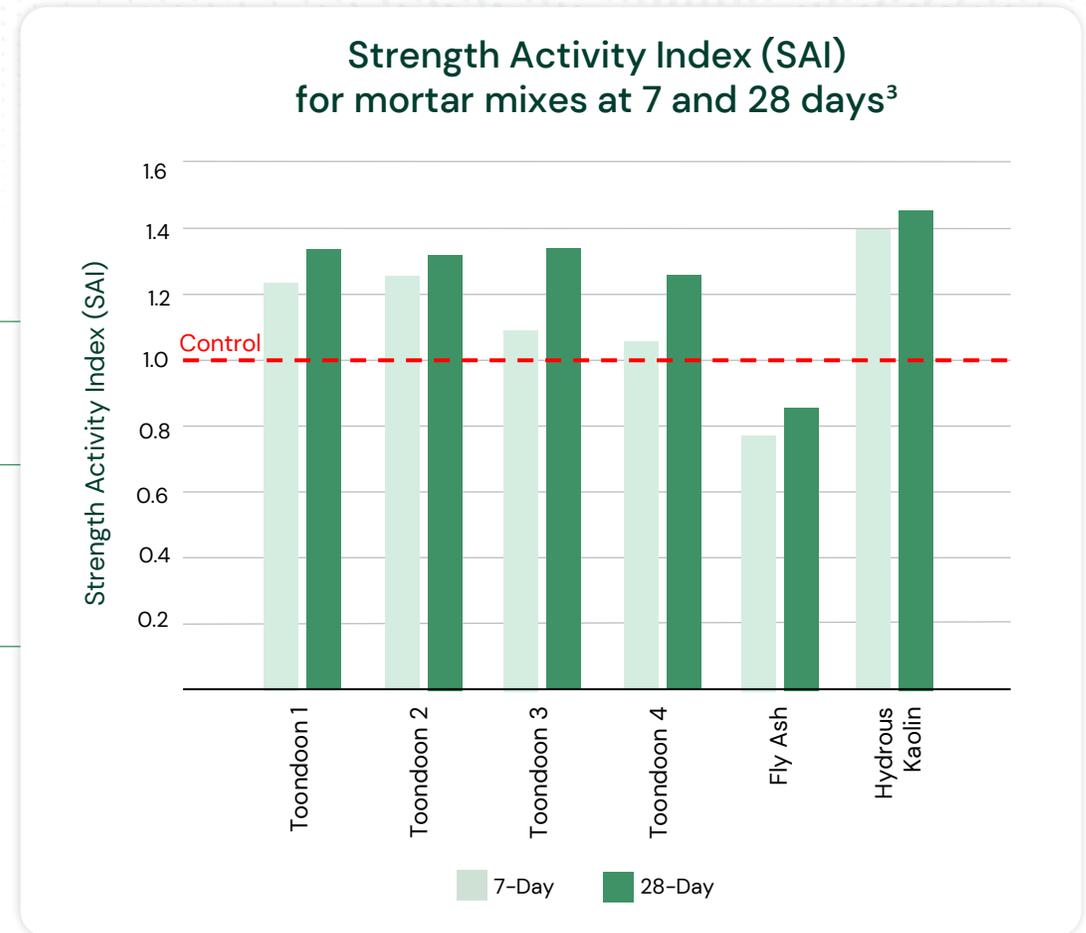
## Collaboration with Central Queensland University produces HRM

Compression strength is primarily expressed using the 28-day SAI factor by evaluating the strength of cured mortar blocks made from the blended cement relative to the strength of a control mortar sample made from Ordinary Portland Cement (OPC) only, i.e., control = 1.0

Blended cement samples were made with OPC substituted with 20% of Zeotech's HRM

The 28-day SAI factor of the four Toondoon samples<sup>1</sup> ranged between 1.24 and 1.35, surpassing the compressive strength of the control mortar sample by a large margin<sup>2</sup>

Results are comparable with those of a higher-cost commercial hydrous (processed) kaolin product and superior to fly ash SCM



# Metakaolin Facility Location

Transport optionality, utilities, future renewables access and regional funding potential



## Site Selection

- Proximity to Toondoon c. 200km (sealed highway) and established road, rail, and sea transport options
- Access to infrastructure and utilities
- Logistics & handling – close to ports with capacity for international markets
- Access to an experienced labour force
- Long-term potential access to renewables

Bundaberg provides an ideal location, enabling coastal and international shipping options, infrastructure, utilities, and a local labour force.

# Near Term Value Drivers

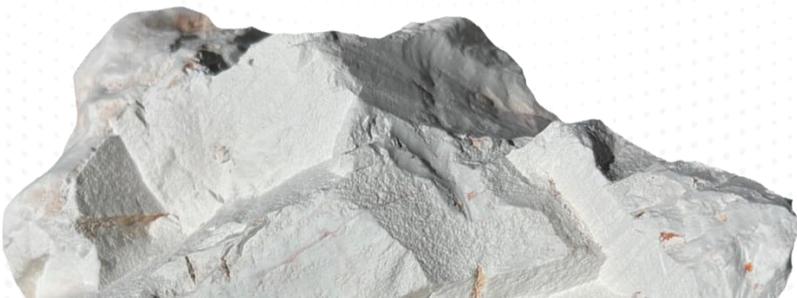
Multiple catalysts pending in a major market advancing low-carbon concrete

## Toondoon Kaolin

- ✓ CQU cement and mortar trials
- ✓ Test pit to completed securing 35t kaolin ore sample
- Progress calcination of kaolin to produce HRM for use in low-carbon concrete trials, and feedstock for scaled-up zeolite production
- Complete mine plan, contractor engagement, and final cultural heritage approvals
- Continued engagement with Wide Bay Burnett Resources Group and local Government to accelerate time to mining

## AusPozz™ High Reactivity Metakaolin

- ✓ Commence life-cycle analysis to evaluate carbon benefit of ZEO HRM in cement and concrete
- Secure industry collaboration to progress low-carbon concrete pilot trials
- Continued engagement with State and Federal Government to advance low-emission technology funding support
- Complete equipment scoping and product testing for HRM production
- Undertake feasibility studies (PFS or DFS) to advance commercial readiness
- Ongoing business development with industry to secure binding off-takes



# Corporate Snapshot



**\$51.6m**

Market capitalisation



**\$2.26m**

Cash at bank  
(30 Jun 2024)



**\$0.03**

Share price



**1.72Bn**

Shares on issue

## Board & Management

**Sylvia Tulloch**  
Non-Executive Chair

**James Marsh**  
Chief Executive Officer

**Peter Zardo**  
Managing Director

**Scott Burkhart**  
Chief Operating Officer

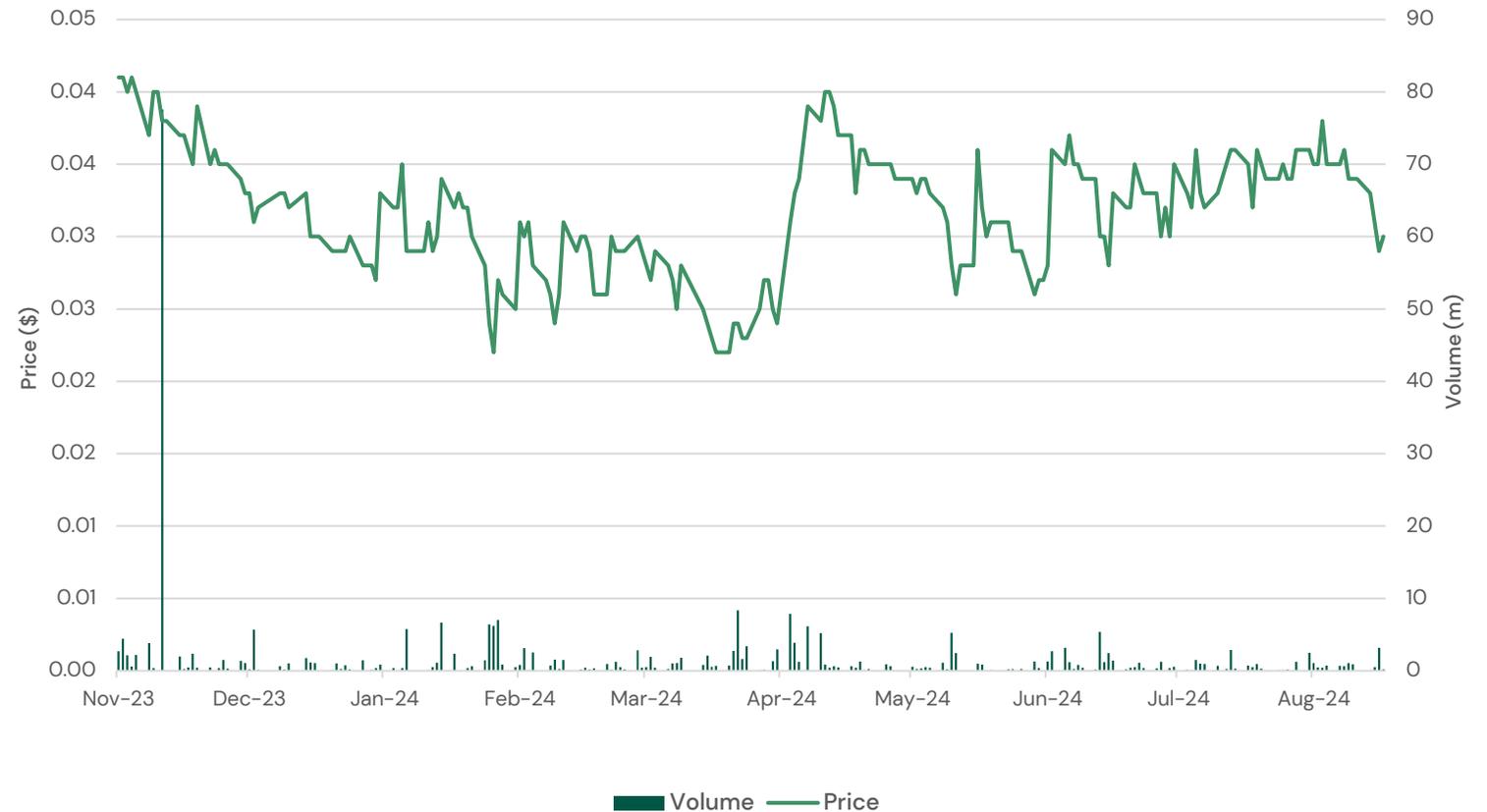
**Rob Downey**  
Non-Executive Director

**Dr. John Vogrin**  
Head of Projects, R&D

## Technical Partners



## Share price and volume



# zeotech



## For Further Information

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