



## **Investor Presentation**

September 2022

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

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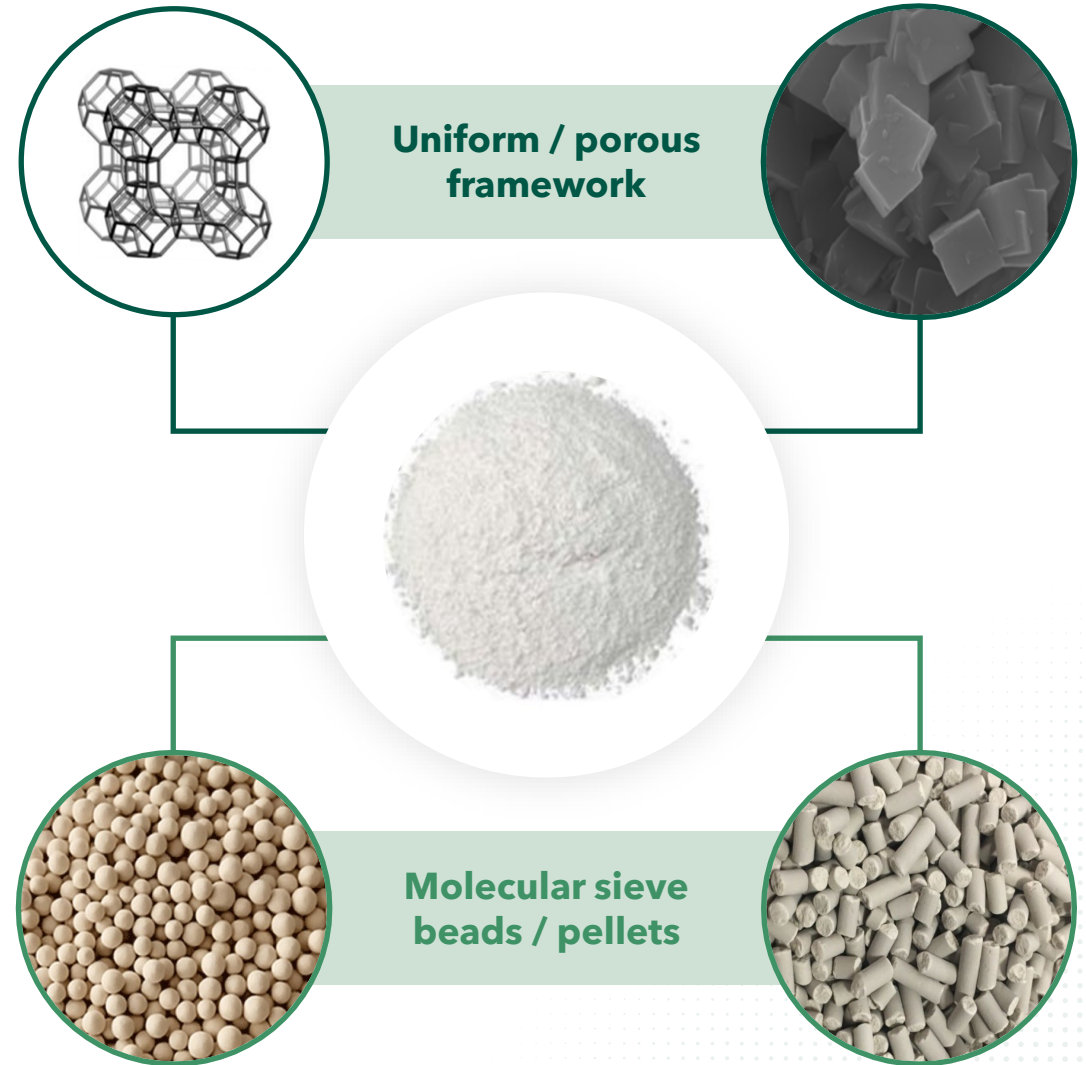


**Our vision** is to contribute to a **sustainable future** by empowering our people to **collaborate and innovate**, utilising proprietary technology and advanced materials.

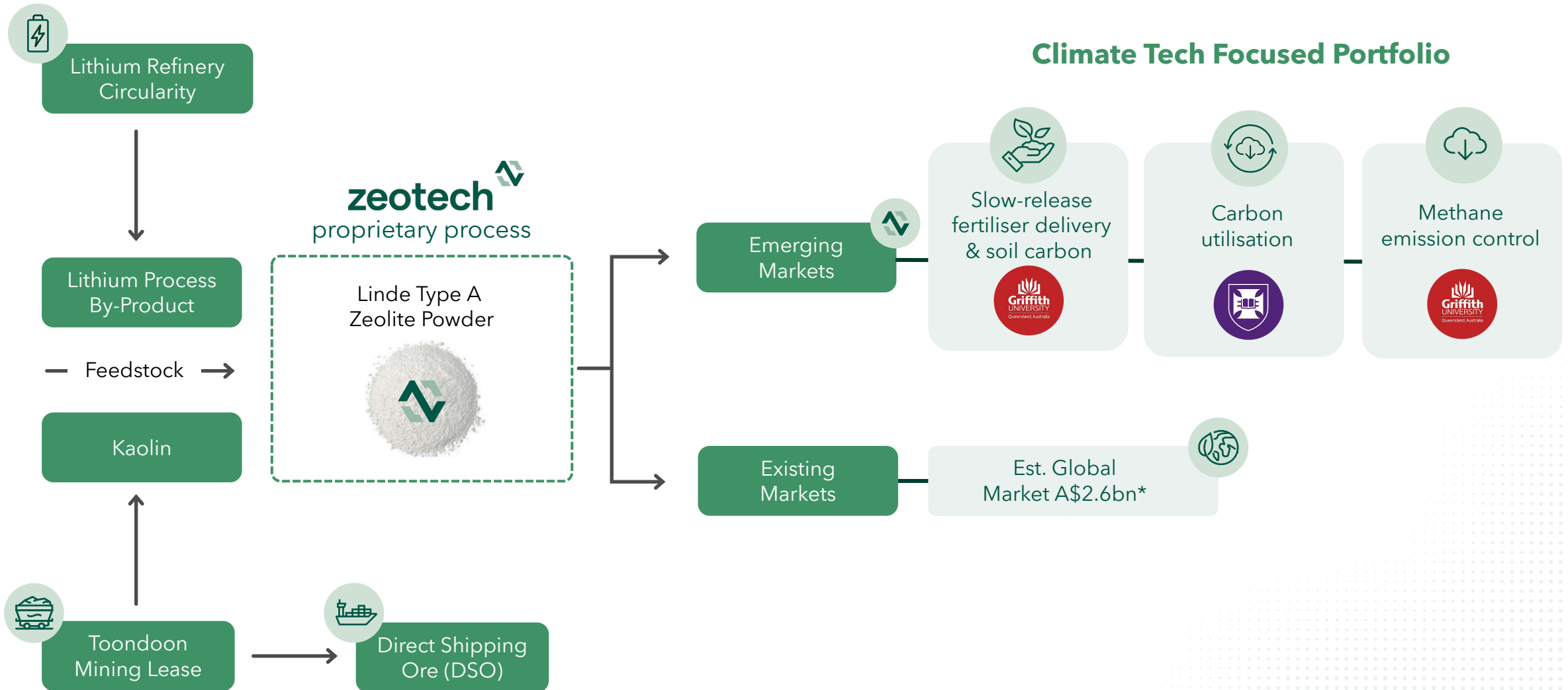
# Manufactured Zeolites

## Zeolites are high-value adsorbents / catalysts with broad applicability

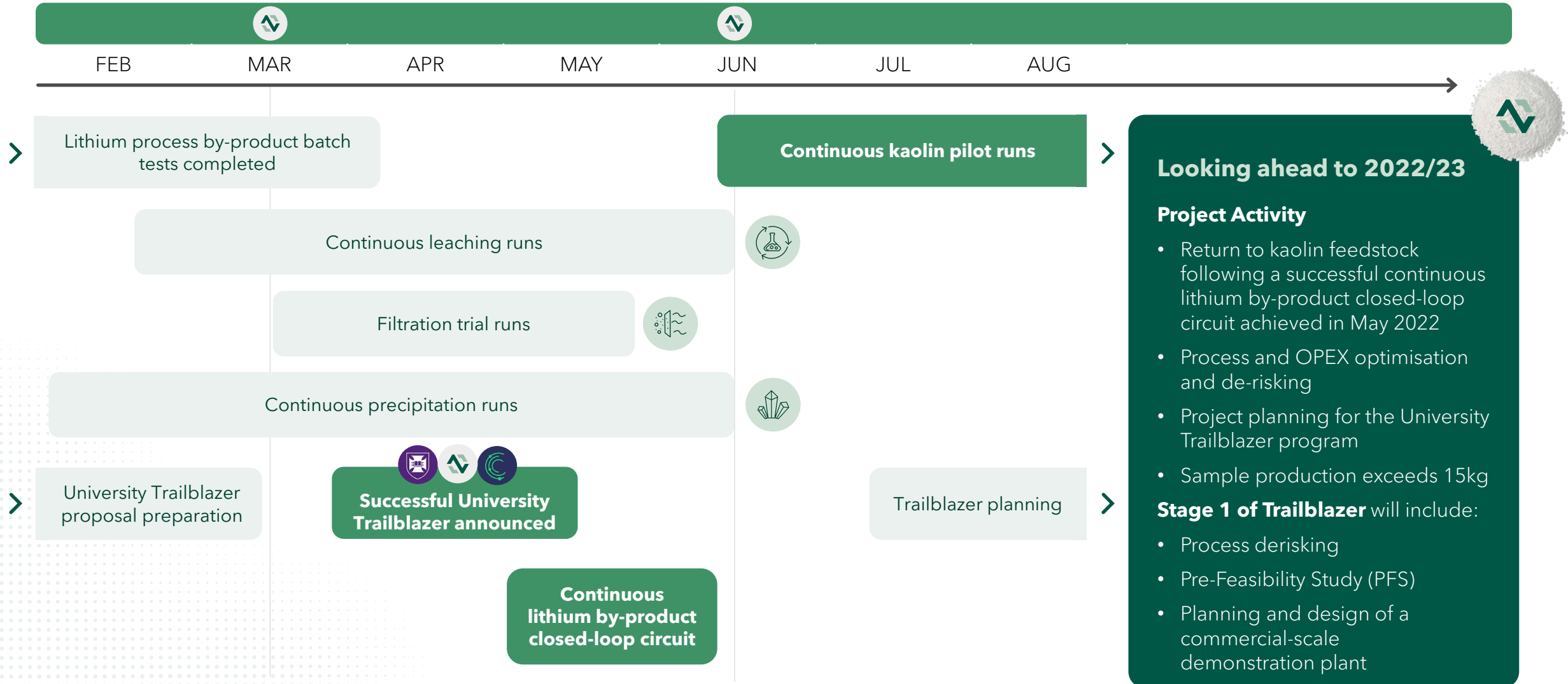
- Manufactured zeolites are aluminosilicate minerals with a **sponge-like structure (framework)**
- Zeolites are made up of tiny pores that make them useful as **adsorbents, catalysts and ultrafine filters**
- Type A zeolites are commonly known as **molecular sieves**
- Can be designed to **selectively adsorb molecules or ions** dependent on their unique construction and can be regenerated repeatedly for re-use
- **Manufactured zeolites act like a magnet** that can hold cations, including heavy metals, ammonia, low level radioactive elements, toxins, petrochemicals, many different types of gases and a multitude of various solutions, offering diverse applications



# Integrated mineral processing technology company



# Pilot validation drives trailblazer opportunity





# Collaboration targets circularity and sustainability



## Lithium refinery circularity

- Developing a circular lithium process tailings solution.
- Proprietary IP to convert lithium process by-product into Type A molecular sieve zeolites.
- Trailblazer grant project win offers platform to commercially validate technology, with project partners UQ and Covalent Lithium.



## CO<sub>2</sub> utilisation

- Aim to develop a sustainable process for converting captured CO<sub>2</sub> into syngas and hydrocarbon fuels such as methanol.
- CO<sub>2</sub> hydrogenation process utilising green hydrogen, facilitated by the development of structured metal-based zeolites as catalysts to produce value add-products.



## Fertiliser delivery & soil carbon enhancement

- Developing agri-products, to improve fertiliser economics & offer soil carbon enhancement:
  - Slow-release nutrient delivery
  - Enhance/protect soil carbon
  - Decrease soil acidification
  - Improve soil moisture levels
  - Pesticide destruction

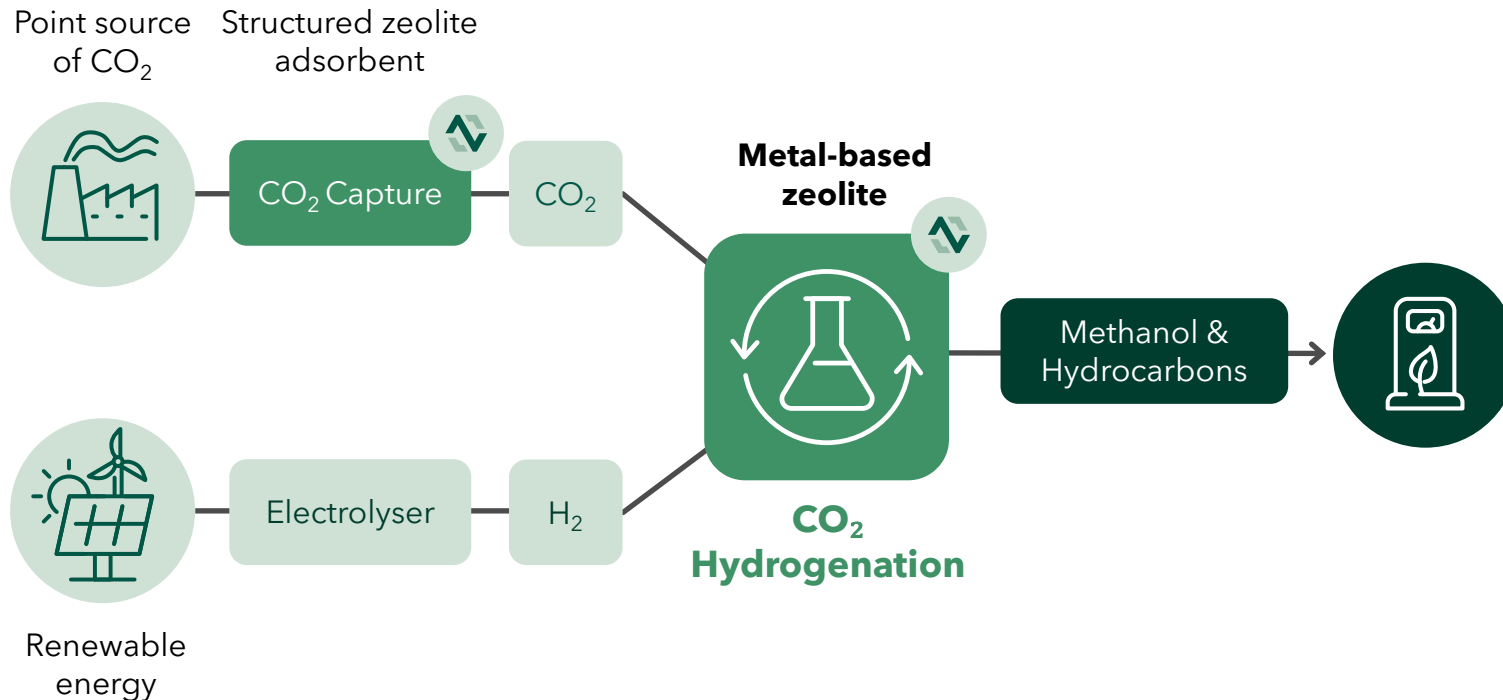


## Methane emission control

- Evaluate properties of manufactured zeolites for methane emission control.
- Initial project to target landfill cover soils to facilitate methane oxidation, as well as decreasing dangerous and nuisance gas emissions.
- Fresh landfill sites have no immediate solution to reduce methane emissions, until retired and capped/engineered.

# CO<sub>2</sub> Utilisation

## Hydrogenation of CO<sub>2</sub> utilising metal-based zeolite catalysts



- Develop a sustainable process for converting captured CO<sub>2</sub> into syngas and hydrocarbon fuels such as methanol.
- The CO<sub>2</sub> hydrogenation process utilising green hydrogen and low-cost structured metal-based manufactured zeolites as catalysts to produce value-add products.
- UQ will undertake the project with ZEO as an industry partner in the ARC Training Centre for the Global Hydrogen Economy.
- CO<sub>2</sub> utilisation process can be an add-on the existing CC technologies or teamed with proven CO<sub>2</sub> separation technology, Pressure Swing Adsorption (PSA).
- Recruitment of a Postdoctoral Research Fellow received more than 30 applicants from across the globe demonstrating strong interest in utilisation technology development.



# Lithium refinery circularity

## Proprietary IP to convert lithium process by-product into Type A molecular sieve zeolites

- UQ / Zeotech has developed **proprietary process technology** to produce type A molecular sieve zeolites from leached spodumene
- The **circular approach** creates a valuable advanced material from lithium refinery by-product and reduces tailings volume
- Australia is expected to become one of the largest producers of lithium hydroxide, a key input for lithium-ion batteries, from **demand driven by vehicle electrification and as global economies target carbon neutrality**
- Trailblazer win offers **accelerated pathway to commercialisation**. Stage 1 activities to target evaluating commercial-scale feasibility (completing PFS)
- Trailblazer project partners (**UQ, Zeotech & Covalent Lithium**) attended Curtin University Workshop in Perth, July 2022.



(image) Dr. John Vogrin - Zeotech

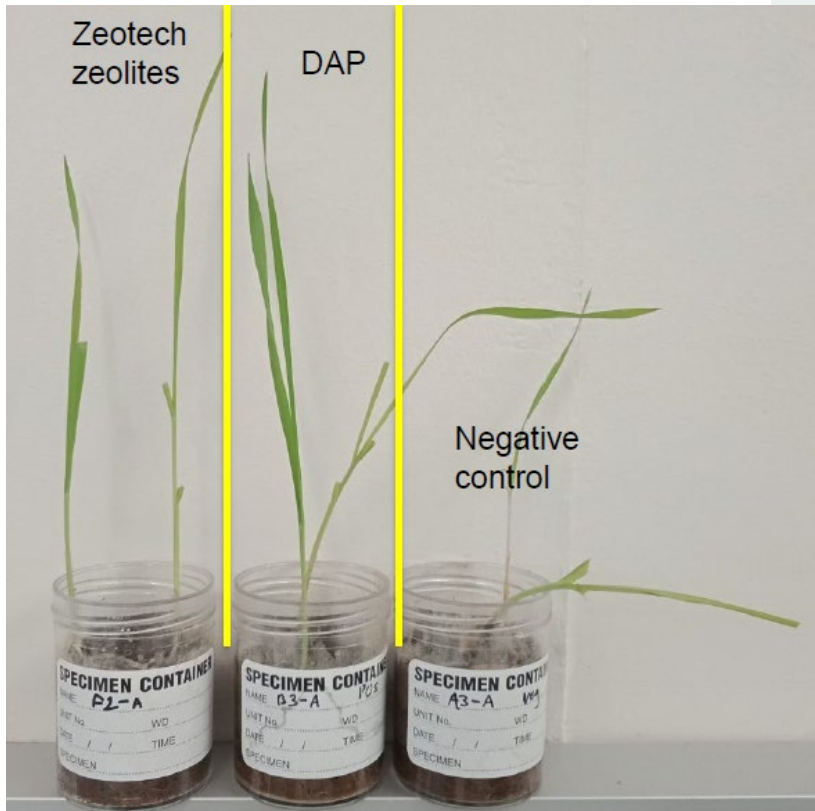
# Developing Agri-Products

## to improve fertiliser economics and enhance soil carbon

- Comprehensive pilot program underway to develop agri-products that aim to improve fertiliser delivery economics, whilst enhancing and protecting soil carbon levels.
- Recent trials revealed exceptionally high phosphate retention by Zeotech products.

The early trial results support a range of potential benefits:

- Compelling **slow-release fertiliser** delivery platform;
- Nutrient interception from waste streams coupled with potential **re-application to agricultural soils as a fertiliser**; and
- Additional **co-benefits** from improved soil moisture retention, decreased soil acidification, eutrophication prevention and increased soil carbon protection.



Indications that Zeotech zeolites are conferring improved plant structure.  
Results from Griffith University trials completed in February 2022.



# Landfill methane control program



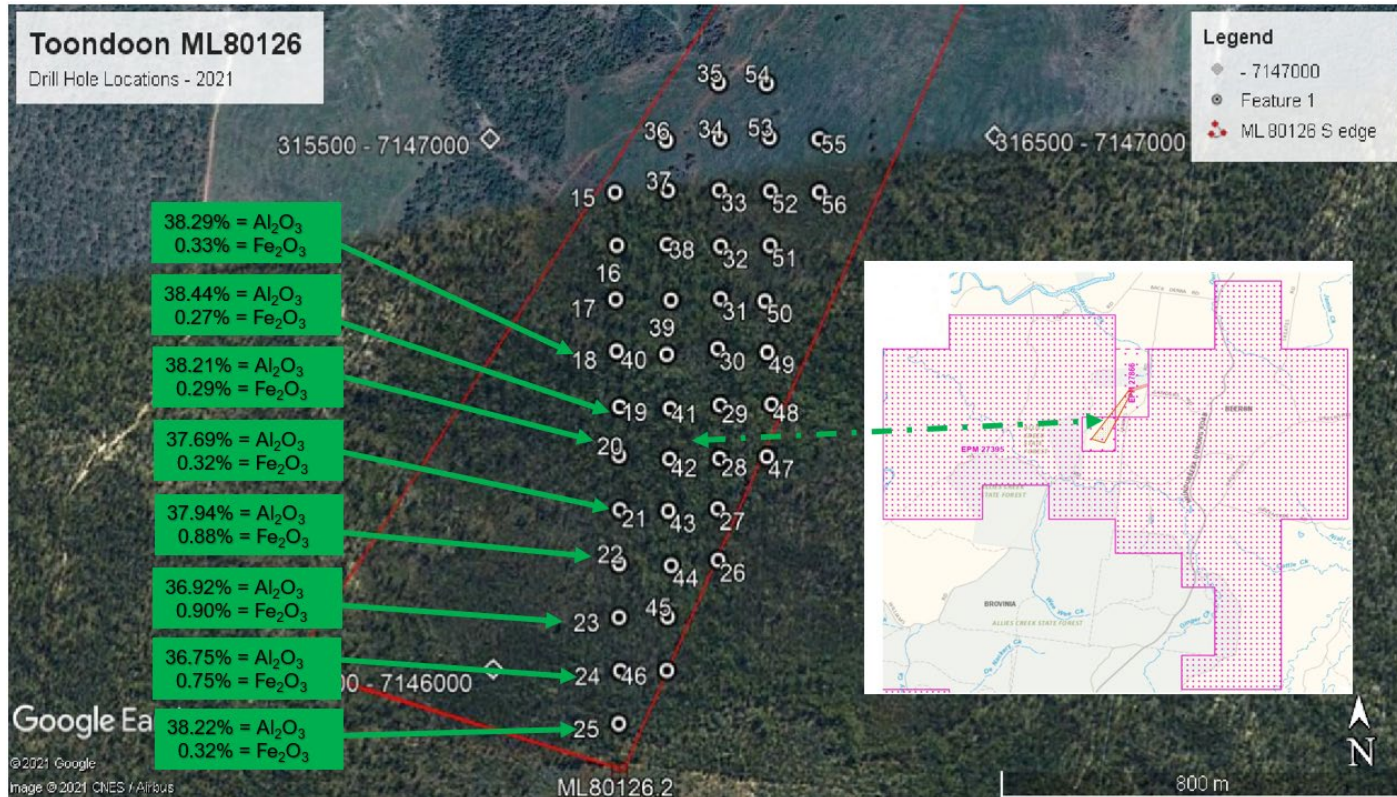
The blue highlight line indicates where an active manufactured zeolite layer could function to intercept and destroy methane emitted from the underlying refuse.

(image) The Image Bank via Getty Images

- Zeolites applied to landfill cover soils could enhance methane oxidation, contributing to **climate change mitigation** as well as decreasing dangerous and nuisance gas emissions.
- Methane is the second most significant GHG with a 100-year **global warming potential 28 times greater than CO<sub>2</sub>**, and landfill methane releases just under 1 Gt of atmospheric CO<sub>2</sub>-e p.a.
- An active manufactured zeolite layer could function to intercept and destroy methane emitted from the underlying refuse within landfill sites.
- Griffith University methane control program development completed with input provided from waste management industry collaboration.
- The comprehensive multi-stage program is supported by a Griffith University study (April 2022), which identified high-level reviews and industry application papers confirming **zeolites offer both biological and chemical methane oxidation potential**.
- Research program in final project contract preparation phase.



# Optimal zeolite feedstock with near-term cashflow potential



## Toondoon Acquisition delivers Approved ML / EPM's over 280 km<sup>2</sup>

- Zeolite OpEx improved circa 30% utilising Toondoon raw ore kaolin (compared to Abercorn sized kaolin), delivering key competitive advantage.
- Exceptionally high-grade raw ore kaolin high alumina, low iron and scale brightness.
- Immediate DSO opportunity, highway access to major ports, shallow low impact mining operation.
- Trade Investment Queensland (TIQ) support introduces Indian counterparties driven by tightening global supply dynamics
- One of the highest-grade raw ore kaolin resources held under approved Mining Lease in Australia (good logistics) and drilling indicates high-grade ore open in all directions.

Image source: ASX announcement 23 August 2021 'ZEO Acquires High-Grade Kaolin Project within Approved ML'

# Toondoon Project Update

## 2021/22 Update



### Planning & Approval Activity

- Completion of a concept study covering proposed mining operations and logistics.
- Regular planning meetings with tenement managers Ardent Group who have facilitated early engagement and private meetings with road authorities at:
  - North Burnett Regional Council (NBRC) for local roads; and
  - The Department for Transport & Main Roads (DTMR) for main roads connecting the three major ports in proximity to the Toondoon project.
- Meetings with Sugar Terminals Limited (STL) and Gladstone Ports Corporation (GPC) relating to proposed Common User Infrastructure (CUI) upgrade at Bundaberg Port.
- Frequent engagement with the Queensland Department of State Development, Infrastructure, Local Government & Planning.
- Early discussions with local third-party mining contractors, transportation and storage providers.



### Marketing Activity

- Two samples sent to separate diversified Indian mineral processing companies for analysis.
- Appointment of an Indian relationship manager to deepen breadth of engagement, facilitate discussions and provide due diligence on prospective companies.
- Regular and ongoing discussions with counterparties in relation to product samples & logistics.
- Indicative DSO FOB and CIF pricing issued to Indian prospects late August

## Looking ahead to 2022/23



### Planning & Approval Activity

- Traffic impact assessment to be undertaken (quotes obtained) to facilitate further discussions with NBRC and DTMR.
- Mine planning, pit design, environmental authority and cultural heritage approvals.

### Marketing Activity

- Increased engagement with Indian RM to strengthen communication.
- Potential to host one of the Indian counterparties for a trip planned to Australia.





# Investment Proposition



## ESG positive company

An emerging mineral processing technology company, with a portfolio of exciting projects targeting circularity and sustainability, all utilising advanced materials 'manufactured zeolites'



## Sustainable proprietary process

Maximising green & sustainable processes for the production of manufactured zeolites = low energy use, reduced production time, high reagent recycling.



## Patent-pending technology

The company's core technology – International Preliminary Examination Authority examiner (Australian Patent Office), expressed a view that all 26 claims in the PCT application are novel and inventive.



## Agri-product development

Developing slow-release fertiliser inputs to improve efficiency, reduce nutrient pollution and protect/enhance soil carbon levels.



## Climate change tech centric

Portfolio of projects targeting the reduction / mitigation of GHG emissions, including carbon sequestration, methane oxidation and carbon utilisation.



## Integration and near-term cashflow

Approved Mining Lease provides exceptionally high-grade raw ore kaolin underpinning low-cost zeolite production and offering accelerated DSO revenue opportunity.



# THANK YOU



Zeotech Limited

**Peter Zardo**

Managing Director

📞 (+61) 7 3181 5523

✉️ [peter@zeotech.com.au](mailto:peter@zeotech.com.au)