# ASX Announcement

9 April 2025

# Project Presentation – COLDry Fertiliser

**Environmental Clean Technologies Limited (ASX:ECT)** ("**ECT**" or "**Company**") is pleased to release the attached project presentation prepared by Zero Quest Pty Ltd, the joint venture with ESG Agriculture Pty Ltd formed to develop sustainable soil health solutions, including the commercialisation of ECT's net-zero COLDry fertiliser product. The presentation is being provided to prequalified prospective lenders to the joint venture as part of the project financing process.

This announcement is authorised for release to the ASX by the Board.

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This announcement may contain forward-looking statements regarding future events or performance, including but not limited to projections of financial results, anticipated growth, and business strategies. These forward-looking statements are based on current expectations, assumptions, and projections that involve inherent risks and uncertainties. Actual results may differ materially from those anticipated due to various factors, including market conditions, regulatory changes, technological advancements, and economic conditions.

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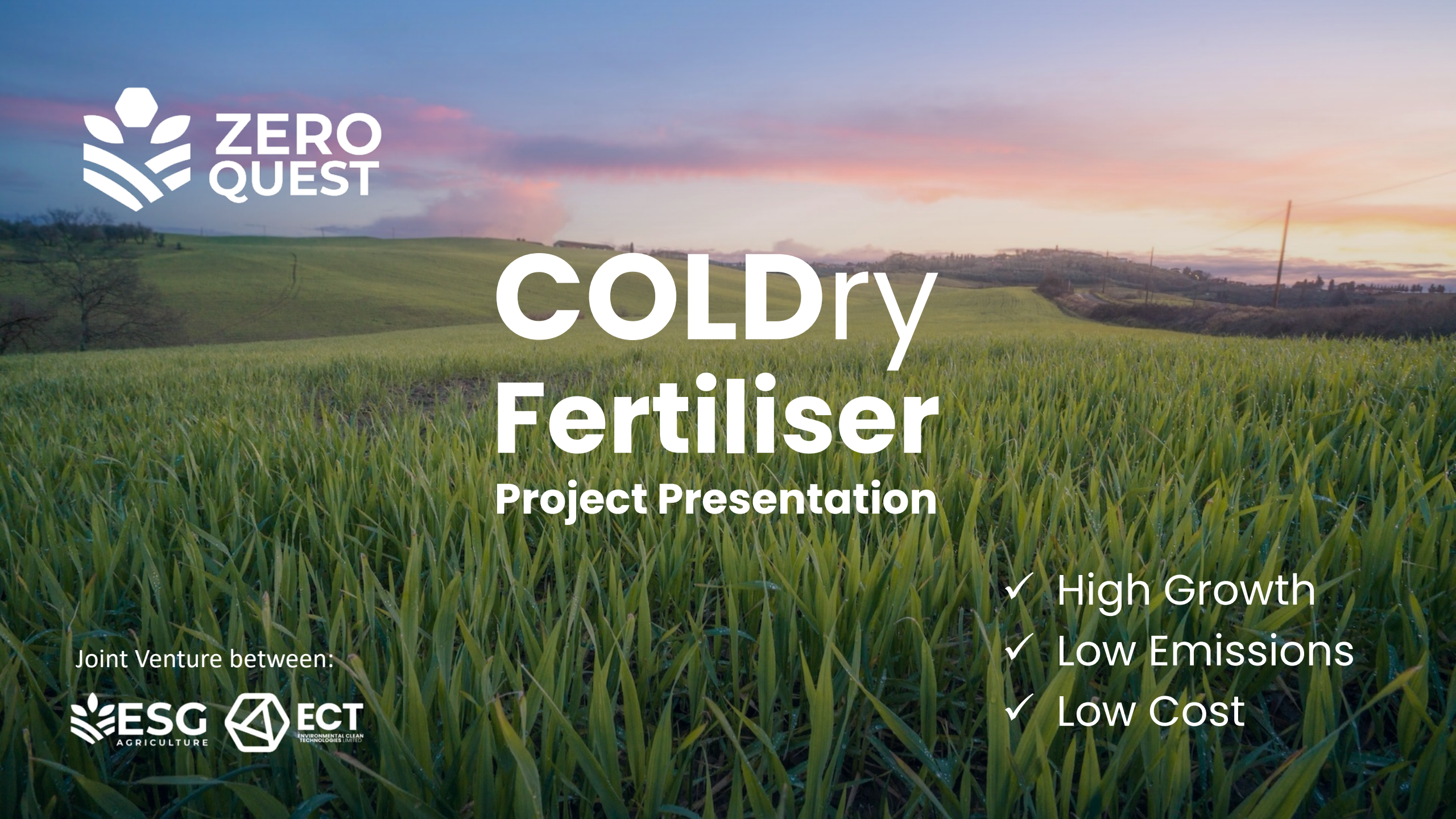
ZERO QUEST
COLDry
Fertiliser
Project Presentation
✓ High Growth
✓ Low Emissions
✓ Low Cost
Joint Venture between:
ESG AGRICULTURE
ECT ENVIRONMENTAL CLEAN TECHNOLOGIES LIMITED

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# COLDry Fertiliser: What is it?

Certified
Organic Lignite

Agricultural Urea

**COLD**ry Process

**COLD**ry Fertiliser

## Spread Rates

**Same as Urea**

Wheat & Barley 200kg/Ha
Pasture 235kg/Ha
Corn & Cotton 300kg/Ha

## Cost

**Less**

than Urea

## Additional Benefits

- Improved yield
- Lower nitrogen loss
- Improved soil health
- Lower emissions

# Fertiliser Market: Solving the problem

## The Fertiliser Problem

- **Low Nitrogen Efficiency**:
  Only 30-50%[1] of applied nitrogen is absorbed by plants; the rest is lost to the environment.
- **Environmental Impact**:
  Nitrogen emissions are 300x stronger than $CO_2$ (equiv. to 1.37t $CO_{2\text{-}e}$ per tonne of urea)[2]. Fertiliser run-off causes algal blooms, harming aquatic life[3].
- **Economic Burden**:
  Inefficient use increases cost. Price volatility impacts farm viability, food security and standard of living. International supply disruption affects 95% of Australia's urea[4].
- **Soil Health Degradation**:
  Decades of land-use intensification have altered the structure and function of vulnerable soils, requiring significant inputs (especially carbon) to maintain productivity[5].

## Market Needs a Better Fertiliser

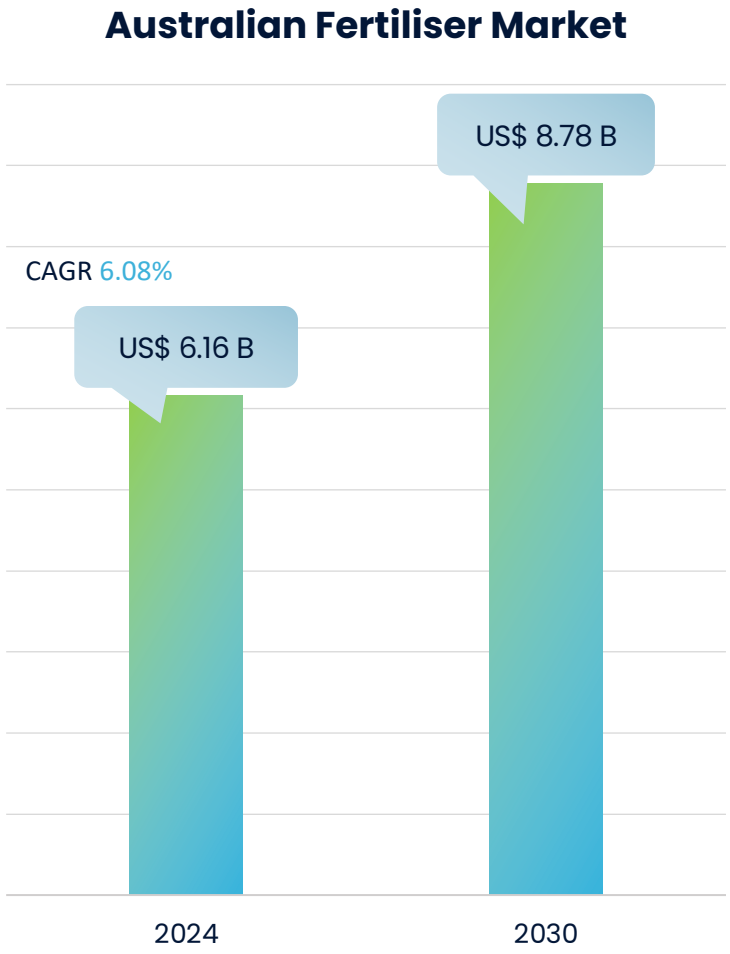
- **Cost-effective solutions**:
  Improvements without huge price increases
- **High yield & quality**:
  Maintain effectiveness to meet growing food demand.
- **Sustainability**:
  Improve soil health and reduce emissions.
- **Reliable supply**:
  Mitigate volatile international fertiliser markets.
- **Reduce barriers to practice change**:
  Compatibility with farming equipment and conventional processes and systems.

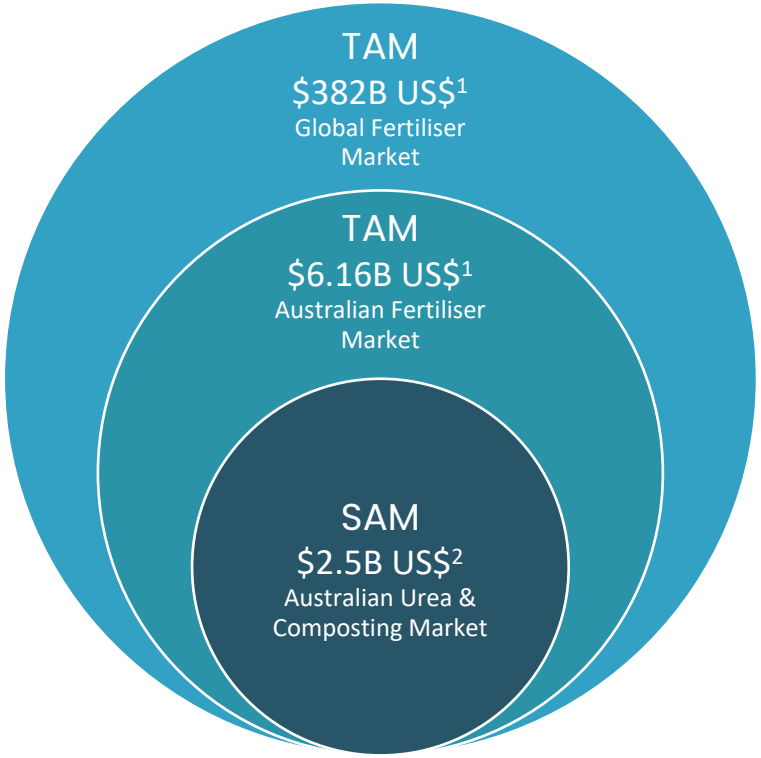
**COLDry Fertiliser does all this!**

# Fertiliser Market: Size

## Australian Market Size

- Valued at US$ 6.16 billion in 2024, with a projected CAGR of 6.08% (2024–2030).
- Driven by rising food demand, precision farming advancements, and sustainability trends.




**TAM**: Total Available Market

**SAM**: Serviceable Available Market

Source: (1) Mordor Intelligence Industry Reports (2) Expert Market Research Report & IMP Market Reports

# COLDry Fertiliser: Value Proposition

## Lower Cost & Higher Yield

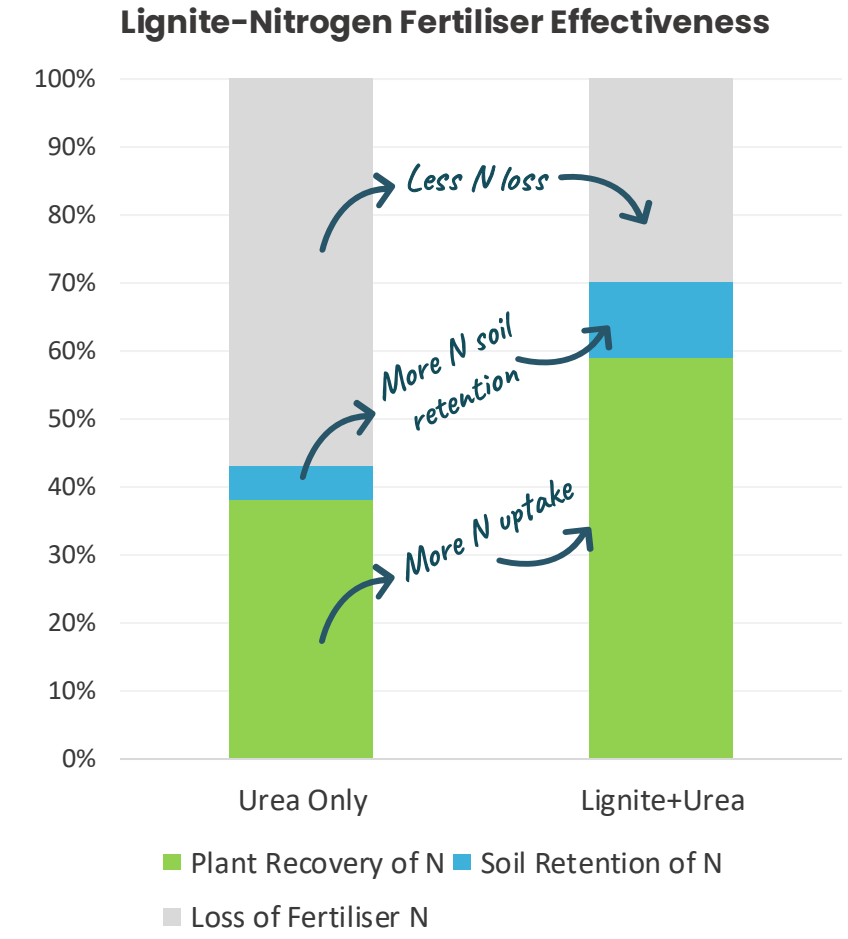
**Plant Growth Benefit**

- ↑ 23% Crop Yield
- ↑ 21% Nitrogen Uptake

**Environmental Benefit**

- ↓ 64% $NO_x$ Emissions
- ↓ 59% Nitrogen Leaching

= Immediate & Future Financial Benefit




*Fate and recovery of nitrogen applied as slow release brown coal-urea in field microcosms: 15N tracer study - Environmental Science: Processes & Impacts (RSC Publishing)

# COLDry Fertiliser: Independent Validation


**Fate and Recovery of Nitrogen Applied as Slow Release Brown Coal-Urea in Field Microcosms: 15N Tracer Study**

Biplob K. Saha, ORCID logo Michael T. Rose, Lukas Van Zwieten, Vanessa N. L. Wong, Terry J. Rosed and Antonio F. Patti

The over-use of synthetic nitrogen (N) fertilisers for crop production can cause environmental pollution through leaching and gaseous losses, resulting in low N use efficiency (NUE). Previous work has shown that brown coal (BC) combined with urea can slow down the fertiliser-N release to better synchronise soil N supply with crop N demand. The study aimed to evaluate the impact of granulated BC-urea (BCU)... Link

**Hybrid Brown Coal-Urea Fertiliser Reduces Nitrogen Loss Compared to Urea Alone**

Biplob K. Saha, Michael T. Rose, Vanessa Wong, Timothy R. Cavagnaro, Antonio F. Patti

Synthetic nitrogen (N) fertilisers, such as urea, are susceptible to rapid dissipation from soil. More gradual release of mineral N from fertiliser may reduce the off-site movement of mineral N, thereby enhancing N supply to crops and minimising negative off-site impacts. These findings support the hypothesis that BC is suitable for developing slow release N fertilisers... Link

### Lignite-urea Fertiliser

- Slow release
- Increased crop yield
- Increased nitrogen uptake
- Lower nitrogen emissions


### COLDry Fertiliser

- **Independent** testing
- Nitrogen **stability**
- Added soil carbon
- Added organic sulphur

## Key Outcomes

### Manufacturer

**Near Zero Loss of Nitrogen**

- Low-temperature COLDry process
- <1% loss of nitrogen during manufacturing
- Solves a costly manufacturing problem

### Farmer

**Added Soil Carbon**

- Enhanced water retention
- Increased organic matter
- Improves drought tolerance
- Microbial activity enhancement

**Sulphur Bonus**

- Improved crop yield
- Enhanced disease resistance
- Improved nutrient use
- Balances other nutrients

# COLDry Fertiliser: The Manufacturing Edge

## Challenges

**Blending**
**Divergent** properties

**Lignite**: high moisture, porous
**Urea**: dry, crystalline

Moisture = clumping
Reactivity = Uneven Release

**Drying**
Nitrogen **decomposition**

Conventional drying temperatures cause urea to break down, forming biuret, which impedes plant N uptake and protein synthesis.

**Cost & Scalability**

High-cost conventional drying is not suitable and not scalable.

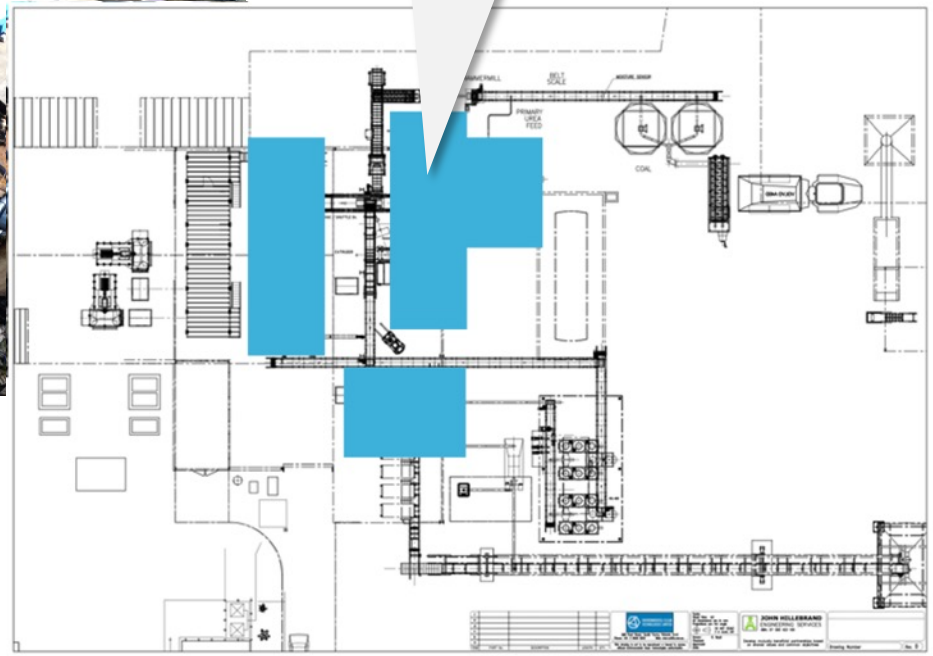
## COLDry Fertiliser Solution

- Uniform **Blending** ✓
- Patented Low-temperature <40°C **Drying** ✓
- Energy & Cost Advantage ✓
- **Scalable** Drying ✓
- Deployable **NOW** ✓

# COLDry Fertiliser Plant: Project Overview

- **Demonstration Phase**
  Up to 30,000 tonnes per annum
- **Commercial Phase**
  Targeting 30,000 to 50,000 tonnes per annum
- **Optimisation Phase**
  Steady-state production of 50,000 tonnes per annum +


Under Patent Review



Building on the existing COLDry demonstration plant at JBD Industrial Park, Maddingley.

# Zero Quest: Market Penetration Strategy

## Target Market

- **Phase 1**: Focus on large-scale farmers and agribusinesses initially.
- **Phase 2:** Explore export markets leveraging ESG's international connections.

## Phase 1
### Penetrate & Prove

| | |
|---|---|
| **Launch** | • Field trials with large-scale farmers, leveraging strong partner relationships. |
| **Commercial Goal** | • Trials expected to convert into bankable off-take agreements ahead of commercial roll-out. |
| **Capacity Utilisation** | • Initial plant output to support early market adoption ahead of expansion in Phase 2. |
| **Proven Formula** | • The product mirrors chemistry from successful past trials, ensuring reliability and rapid scalability. |

## Phase 2
### Expand & Disrupt

| | |
|---|---|
| **Scale Up** | • Target 5-10x plant size<br>• Re-design to incorporate learning & optimisation from Phase 1 |
| **Expand** | • Target 2+ potential projects across SA and Vic<br>• Pursue overseas opportunities |
| **Profitability** | • Target 100%+ GP margin growth<br>• Enhanced design and economies of size and scale |
| **Disrupt** | • Deliver the worlds first net zero fertiliser that is cost competitive with conventional fertilisers |

# Zero Quest: Leveraging Expertise

## Technology & Production

**Joseph van den Elsen**
**Chair**
*LL.B., B.A, M.Sc (Mineral Exploration)*

Senior Executive with management experience across mineral exploration, business development, governance, public company strategy and client relationship management.

**John Tranfield**
**CEO**
*B.Eng-Phys-Math, MBA, GAICD, PMP, CPEng, WSET I II, $H_2$ Researcher*

20+ years engineering experience handling high-profile projects.

**Jason Marinko**
**Non-executive Director**
*BCom, FFin, GAICD, MBA*

Seasoned public company CEO, Director, and Chairman with a proven track record leading technologies to commercialisation.

**Sam Rizzo**
**Non-executive Director**
*BA (Urban and Regional), Grad Dip (Honours) in Urban and Regional Town Planning*

20 years major project experience including renewable energy.

## Sales & Marketing

*ESG Agriculture brings proven expertise in **agribusiness**, **manufacturing**, and **market development**. With a strong focus on **commercial outcomes**, ESG leverages deep industry networks and insights to drive **market adoption** and **growth** across the **agricultural sector**.*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# References


1. According to the International Service for the Acquisition of Agri-biotech Applications (ISAAA), only 30-50% of applied nitrogen is absorbed by plants, with the remainder causing significant environmental impacts. Link: https://www.isaaa.org/resources/publications/pocketk/46/default.asp

2. The World Bank reports that nitrous oxide ($N_2O$) has a global warming potential nearly 300 times that of $CO_2$, with agriculture being a significant contributor to these emissions. Link https://www.wb6cif.eu/wp-content/uploads/2024/10/CBAM.pdf

3. The U.S. Environmental Protection Agency (EPA) notes that excess nitrogen and phosphorus from fertiliser run-off can cause algal blooms, which consume oxygen and block sunlight, leading to the death of aquatic life. Link: https://www.epa.gov/nutrientpollution/effects-dead-zones-and-harmful-algal-blooms

4. Department of Agriculture, Fisheries and Forestry and World Bank statistics. Link: https://wits.worldbank.org/trade/comtrade/en/country/AUS/year/2023/tradeflow/Imports/partner/ALL/product/310210

5. Soil Health Assessment: Department of Climate Change, Energy, the Environment and Water. Link: https://soe.dcceew.gov.au/land/assessments

6. References:
    - Fate and Recovery of Nitrogen Applied as Slow Release Brown Coal-Urea in Field Microcosms: 15N Tracer Study (link).
    - The Nitrogen Dynamics of Newly Developed Lignite-Based Controlled-Release Fertilizers and the Effect of Ferrous Iron Application on Ryegrass in a Climate-Controlled Lysimeter System (link).
    - Hybrid Brown Coal-Urea Fertiliser Reduces Nitrogen Loss Compared to Urea Alone (link).
    - The effect of lignite on nitrogen mobility in a low-fertility soil amended with biosolids and urea (link).