Pathway to 2P Reserve and Urea Production

LEIGH CREEK ENERGY Limited

Corporate Presentation

November 2018

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This presentation may also contain non-IFRS measures that are unaudited, but are derived from & reconciled to the audited accounts. All references to dollars, cents or $ in this presentation are to Australian currency, unless otherwise stated.

Mineral Resource Compliance Statement

Estimates of Mineral Resources reported in this announcement were initially reported & released to the ASX on 8 Dec 2015. We are not aware of any new information or data that materially affects the information included in the 8 Dec 2015 announcement & all the material assumptions & technical parameters underpinning the estimates in that announcement continue to apply & have not materially changed.

Gas Resources Compliance Statement

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Presentation Outline

- Overview
- Project Status
- Pathway to Commercial
- Urea/Ammonia Case
- Technology/Site
- Corporate
- Summary

LEIGH CREEK ENERGY Limited

ASX: LCK and LCEP Overview

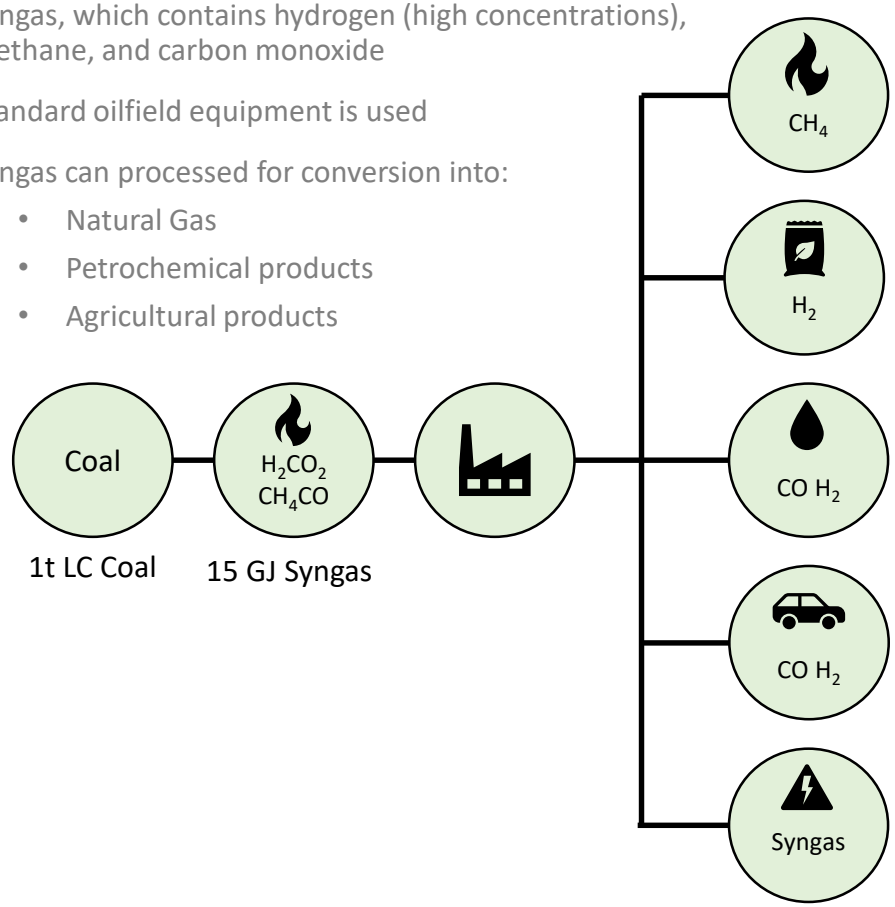
- Commercial Pathway confirmed
  - LCEP produces syngas which LCK plans to use to produce Fertiliser
  - Sovereign risk in power and gas markets
  - Renewables, Regulation, Price control
- Milestones
  - April 2018 – environmental approval received
  - October 2018 – LCEP operations - "First Gas"
  - Anticipated upgrade to 2P Reserve – Q1 2019
- Shareholder support
  - AUS, US and OS institutions
  - Strategic relationships with China SOEs
- Leigh Creek Energy Project (LCEP) – 550kms north of Adelaide
  - LCK 100% owner and operator
  - 50+ year project
  - Nationally significant resource
  - Ideal location – infrastructure in place, geology
  - Approval process and regulatory framework is clear
  - Strong relationships at Public Service and Ministerial levels

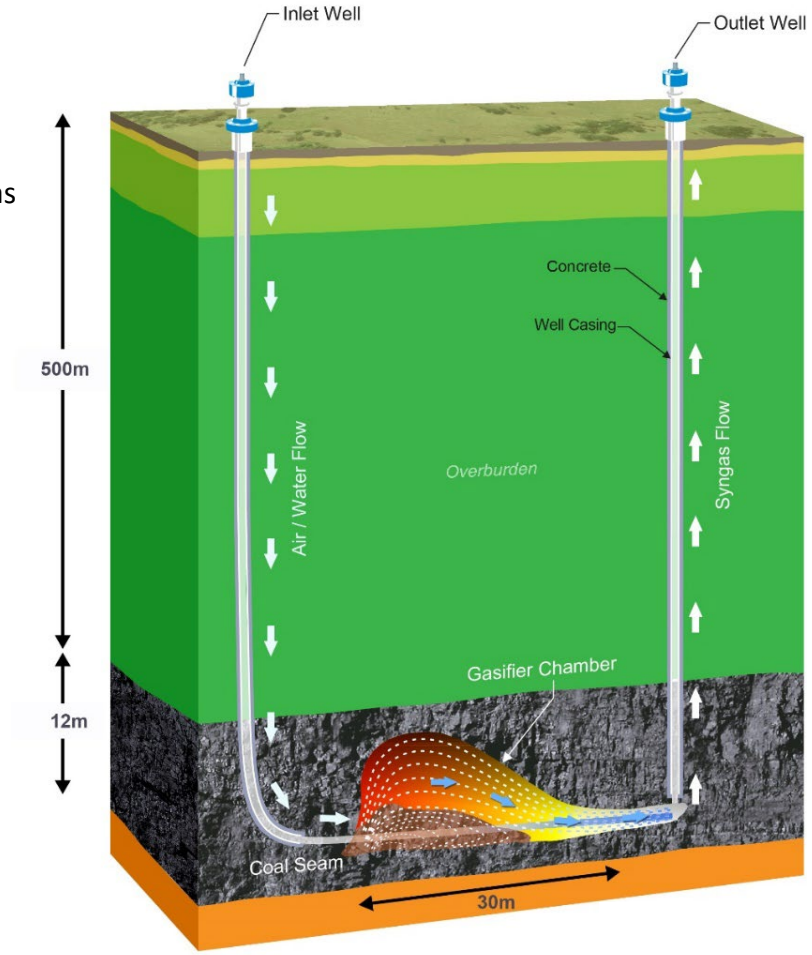
"the Leigh Creek site represents one of the strongest opportunities for low risk commercial UCG anywhere in the world" Dr Gary Love

PCD is Operational!

Technology

- The LCEP utilizes In-Situ Gasification ("**ISG**") process on the Leigh Creek Coalfield to develop the deep coal resources that are unable to be accessed through open-pit mining
- The ISG process converts solid-state underground coal to Syngas, which contains hydrogen (high concentrations), methane, and carbon monoxide
- Standard oilfield equipment is used
- Syngas can processed for conversion into:
  - Natural Gas
  - Petrochemical products
  - Agricultural products





ISG Schematic

Leigh Creek Coalfield “Best site in the world … ”

1. Remote location; heavily impacted by previous mining operations
2. Leigh Creek coal ideal for ISG
3. Open-cut coal mine supplied Port Augusta power station (250km away) for 60 years until 2016
4. Established accommodation and town services in Leigh Creek and Copley
5. Infrastructure already in place:
   - Power
   - Road and Rail
   - Airport

- ✓ Minimal and manageable land use conflict
- ✓ Manageable groundwater resources
- ✓ Minimal environmental receptors and impact
- ✓ Suitable geology creates low-risk of:
  - Subsidence
  - Fugitive gas
  - Groundwater contamination - no useful water resource or aquifer in vicinity of operations

refer Camp, W, and White, J “Underground Coal Gasification: An Overview of Groundwater Contamination Hazards and Mitigation Strategies, March 2015, Lawrence Livermore National Laboratory

April 19 - Environmental Approval

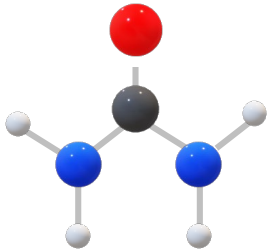
- "the Leigh Creek site represents one of the strongest opportunities for low risk commercial UCG anywhere in the world"
- **Key Findings**
  1. **Geology**
  2. **Underground water**
  3. **Regulatory oversight**
  4. **Operating principles**

SA (LCK) and Qld (CNX+LNC) comparison
"material differences related to site suitability, operational practices and … regulatory oversight"

- South Australian legislation specifically contemplates and outlines approval pathway for ISG projects (*S 35, Petroleum and Geothermal Energy Act, 2000*)

Urea and Ammonia – high demand products

- Value added products with diverse range of downstream products
- **Urea** ($NH_3 + CO_2$) – Primarily used for fertiliser (primary production)
- **Ammonia** (NH_3) – Primarily used in chemical/industrial, minerals processing, explosives, etc
  - Emerging Hydrogen economy

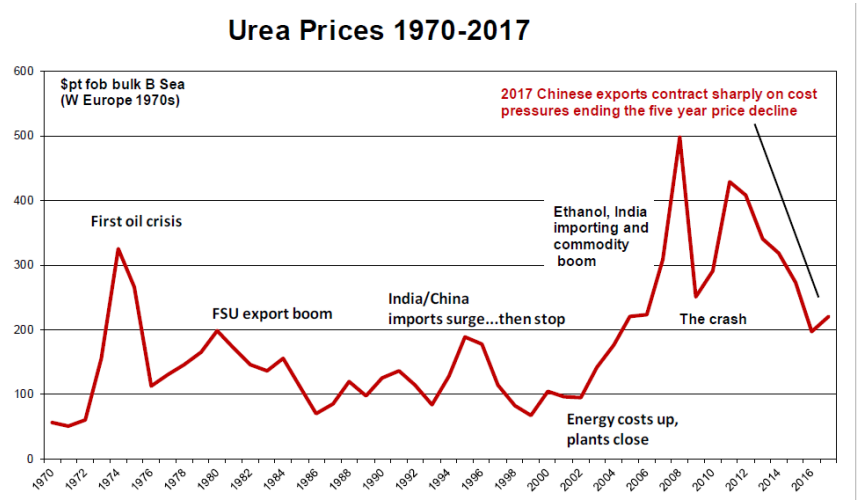


Urea (CH_4N_2O)

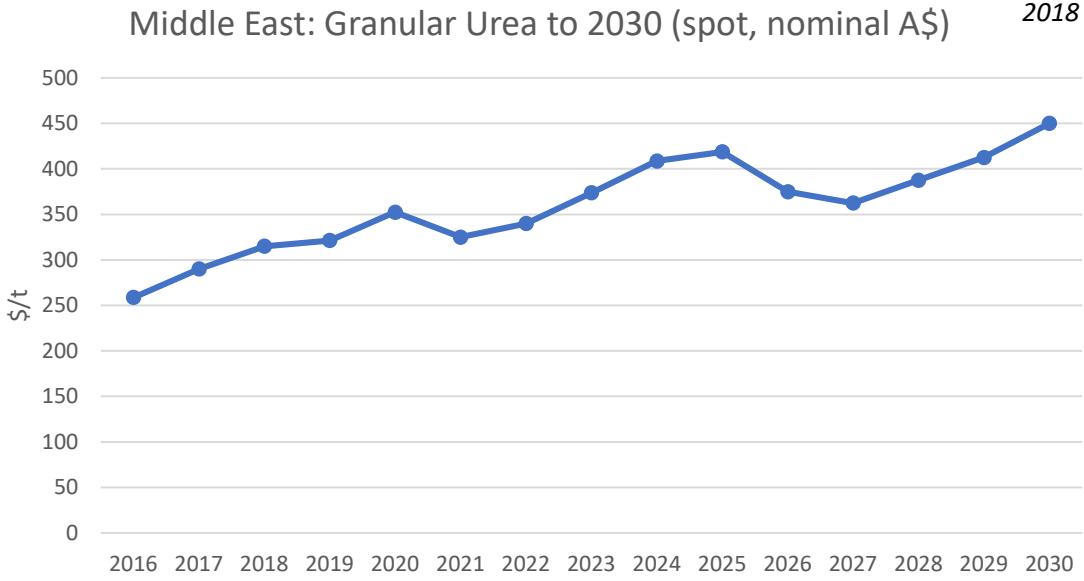
Source: ThyssenKrupp Website

Urea market commentary

- Urea is an energy product
- Price (history and forecasts) closely correlated to energy prices
- Global production capacity 222Mt, increasing by 5% pa to 2025 (mainly in India)
- Australian Urea demand
  - Stable at 2.5Mt/a (>90% imported)
- World demand (currently at approximately 175mta) is projected to increase until 2020, and 2016/17 was a cyclical low in terms of pricing
  - Population growth is expected to continue to increase
  - China - population growth in the short term and decreasing capacity/production due to environmental controls
  - India - population growth and increased standard of living expectations
  - North America - reducing imports (over long term)
  - Emerging economies and increase in their living standards
  - Urbanisation of rural areas
    - Reduction in arable land → higher yields
  - GDP growth → higher value products



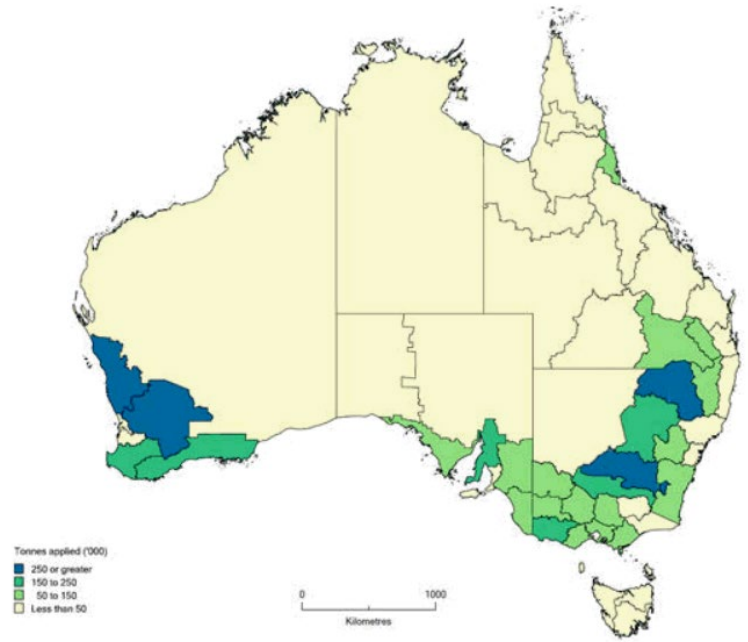
Source: Profercy Urea Outlook to 2030, January 2018 (Copyright 2018 Profercy Ltd)



Urea and Ammonia market in Australia

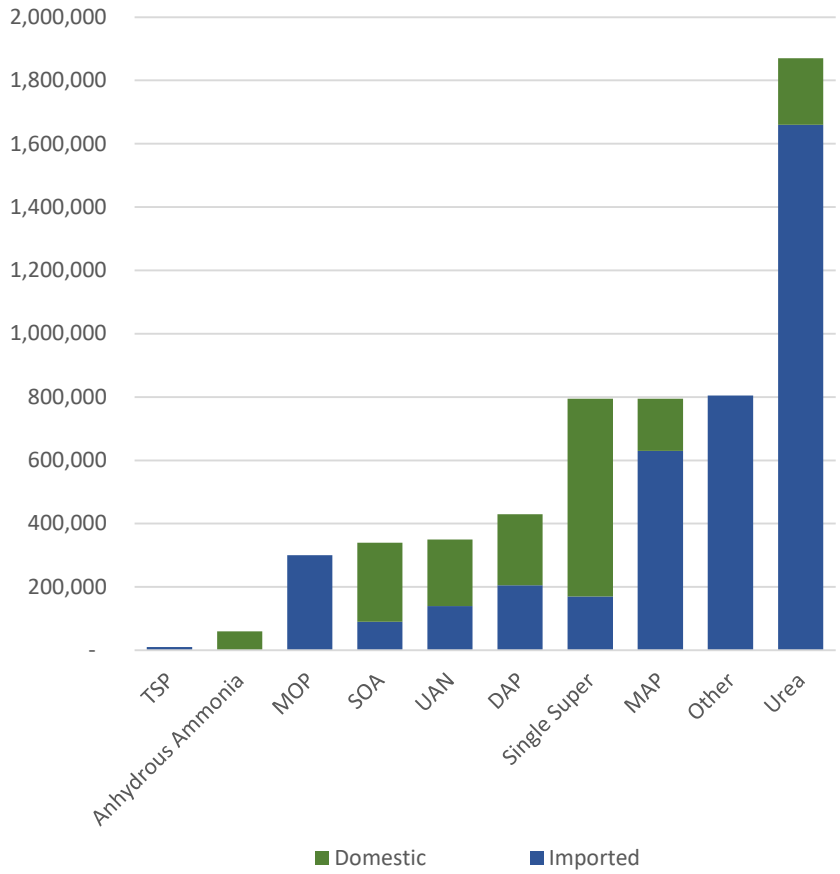
- Australia is an importer of fertiliser products, especially Urea
- Sea freight to Australia is a significant cost
  - Urea shipped from the Arabian Gulf spends an average 24 days on water
- Australian dollar currency fluctuations impact the profits of importers
- Main countries of origin for Urea imported in Australia:
  - Middle East
  - China
  - Bangladesh
  - Malaysia
  - Russia

All fertiliser applied by tonnes ('000), 2016-17
by Natural Resource Management Regions



Source: Australian Bureau of Statistics

Australian Fertiliser - Average Annual Sales (t)



Source: Fertilizer Australia & Department of Agriculture and Water Resources

This graph shows average fertilizer sales in Australia for 2012-2017

Note: Domestic Single Super is manufactured from phosphate rock that is imported

LCK will use Syngas to make Fertiliser products

1. Scoping Studies complete - highest economic value
2. Cost efficiency through vertical integration
3. LCK gas production costs and volume stable vs market volatility and increasing
4. LCEP “Syngas” contains high levels of hydrogen suitable for low-cost Urea and Ammonia production to serve the currently high-priced domestic Australian market
4. Geographic advantage
   - Close to large demand centres
5. High value products
   - eg. Urea price at cyclical lows – long term price stability, forecast to improve
6. Pre-existing critical infrastructure on site – rail, road, brownfield
7. Social License - Fossil fuel to energy vs. Feed the World, supports farmers

Concept Selection Study - ThyssenKrupp

1. Capacity constraints
2. Economic feasibility
3. CAPEX and OPEX commentary
4. Sensitivity Analysis
5. Concept Study Analysis

- ThyssenKrupp is a Global Engineering Conglomerate
- 2016/2017 Sales: €51.5B
- Present in 80 countries
- 155,000+ employees

thyssenkrupp engineering. tomorrow. together.

Source: ThyssenKrupp Website

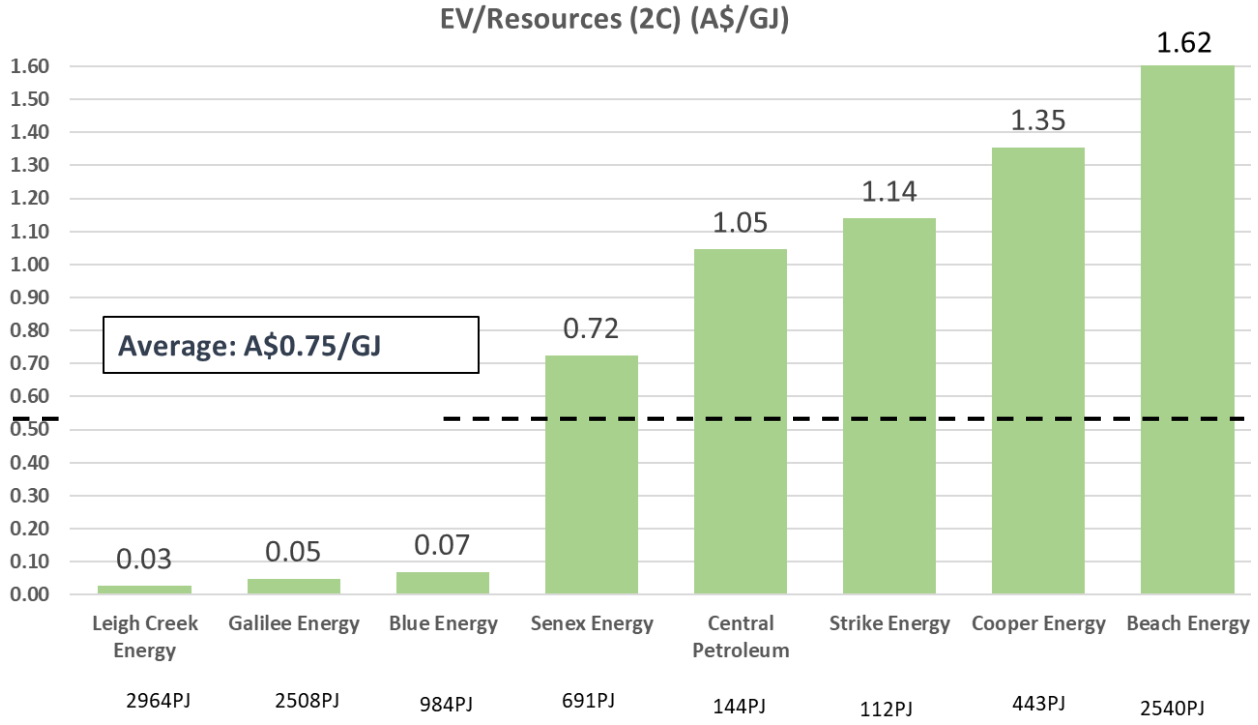
Pathway to Commercial – 2 year approvals and funding + 2 year construction

Q4 2018	PCD Syngas Production
Q1 2019	2C Resource Upgraded to 2P Reserve
2019	PFS, geotechnical investigation, determine corporate strategy for production facility (may include offtake negotiation/agreements)
2020	Feasibility Study
2021 +	FEED, FID, fabrication of commercial facility modules
2022-23	DED, Construction of commercial plant
2023 +	Commissioning, production, full operations

PCD Operations

Fertiliser Production and Distribution

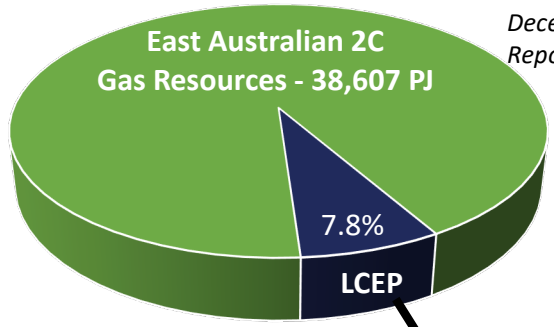
Leigh Creek Peer Group / Market Analysis



Note: Recent M&A activity at $0.50-$1.50/GJ

As at 31 October 2018

Source: Energy Quest, December 2017 Quarterly Report



- The current resource estimate of LCEP:
  - 2,964 PJ
  - ~3 TCF
- Approximately 7.8% of the estimated total East Australian 2C gas resource (of 38,607 PJ)

LCK Stock Price Timeline

No.	Date	Event
1	Apr 18	Environmental Approval
2	Sep 18	Final Approval for PCD Operations
3	Oct 18	First Syngas

Key Stats	
ASX: Ticker	LCK
Share Price	[$0.17] per share
Shares Outstanding	471.53 million shares
Market Cap	[$82.5] million
Cash vs. Debt	$8.3 million (Sept-30) | No Debt[1]
52-week Range	$0.085 (Low) - $0.38 (High)

Top Shareholders	# of Shares	% of Total
China New Energy Group	136.3m	28.9
CITIC Australia	17.2m	3.7
Total	471.5m	100

Shareholder Groups	# of Shares	% of Total
Top 20	248.4m	52.7
All Other (~3,200 shareholders)	223.1m	47.3
Total	471.5m	100

Note 1: LCK has a $10.5 million lending facility with the CBA supported by R&D Tax incentives through AusIndustry and a rebate receivable due of $9 million in June 2018

Experienced Executive Team

Name	Background
Justyn Peters *Executive Chairman*	In addition to his background as a lawyer, Justyn has a depth of experience in the ISG industry as well as leading work in senior management roles. He also has experience in the mining industry, working with industry representative bodies, and various state and federal environment departments and authorities.
Phil Staveley *Managing Director*	Phil is a financial executive with 30⁺ years of experience working in resources and oil and gas sectors. Over the last 20 years he has performed work as a CFO, CEO, and MD roles across Australia, Asia and Latin America. For LCK, Phil serves in financial, commercial and operational functions as the company's Managing Director.
Justin Haines *General Manager - Technical*	Justin is the technical lead at LCK, and has broad experience across engineering and geological services. Most recently, he was the Technical Manager for Carbon Energy Ltd (CNX), successfully operating the CNX ISG facility.
Cristian Bolda *Operations Manager*	Cristian has experience in delivering high-value petroleum and infrastructure projects internationally. Senior management roles in the Middle East, Wheatstone LNG project (WA), and the APLNG gas field facilities (QLD), as well as with various power station upgrades and bioremediation plants.

Right Market, Right Time, Right Place, Right Product

1. Near term de-risking events
   - ✓ Environmental Approval
   - ✓ PCD operations
   - ⏳ PRMS upgrade to reserve
2. Strong Fertiliser business case
3. Flexibility of end products
4. Good market dynamics and strong macro trends
5. Large resource – 2,964PJ 2C 50+ years
6. World class site, existing infrastructure, suitable geology
7. Resource characteristics ideal for ISG

Resource + Approval + Execution = Results

Urea and Ammonia - production flowchart