LEIGH CREEK ENERGY Limited

Growing Our Future

Delivering on a focused strategy

September 2020

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Gas Resources Compliance Statement

For information related to the 2P Syngas Reserve CLICK

The Company confirms that it is not aware of any new information or data that materially affects the information included in the above announcement and that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed. All estimates are based on the deterministic method for estimation of petroleum resources.

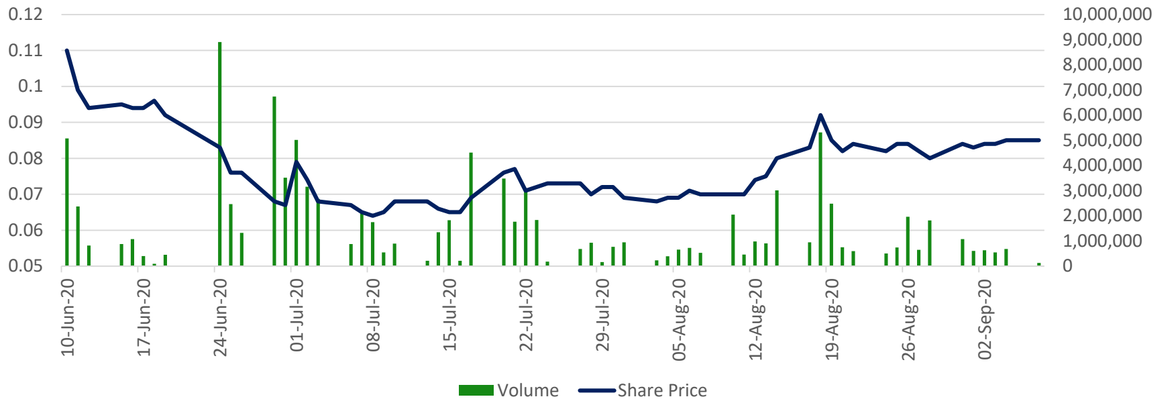
Company Snapshot

Leigh Creek Energy is a South Australian energy developer focused on production of syngas for use in urea and, more recently, conventional oil & gas exploration in the Cooper Basin

Capital Structure

ASX Code	LCK
Share Price[1]	A$0.09
Shares Outstanding	656 million
Market Cap	A$46.6 million
Cash on hand[2]	A$7.4 million

Share Price



Top Shareholders [1]

Name	Shares Held	%
China New Energy Group	136,333,334	20.74
Crown Ascent Development	29,501,347	4.49
Citicorp Nominees Pty Ltd	18,959,416	2.88
Bart Properties Pty Ltd	15,630,058	2.38
Rubi Holdings Pty Ltd	13,516,584	2.06

Recent Milestones

Awarded two Cooper Basin permits	1 July 2020
Oversubscribed placement completed	24 June 2020
Granting of the Petroleum Retention Licence	10 June 2020
China New Energy Joint Venture Agreement	20 April 2020
Environmental approval for further drilling	3 April 2020

1 As at 8 September 2020

2 As at 30 June 2020

Investment Proposition

Harnessing gasification and urea production technology in support of Australia's food surety

- **Significant future uplift potential** through development of a fully integrated urea production facility
- **Creating shareholder value** by successfully de-risking development of the flagship Leigh Creek Energy Project
- **Production optionality** with potential to produce hydrogen and/or methane from syngas
- **Portfolio diversification** with the Leigh Creek Energy Project and recent investments in Cooper Basin oil and gas exploration

Near term price catalysts

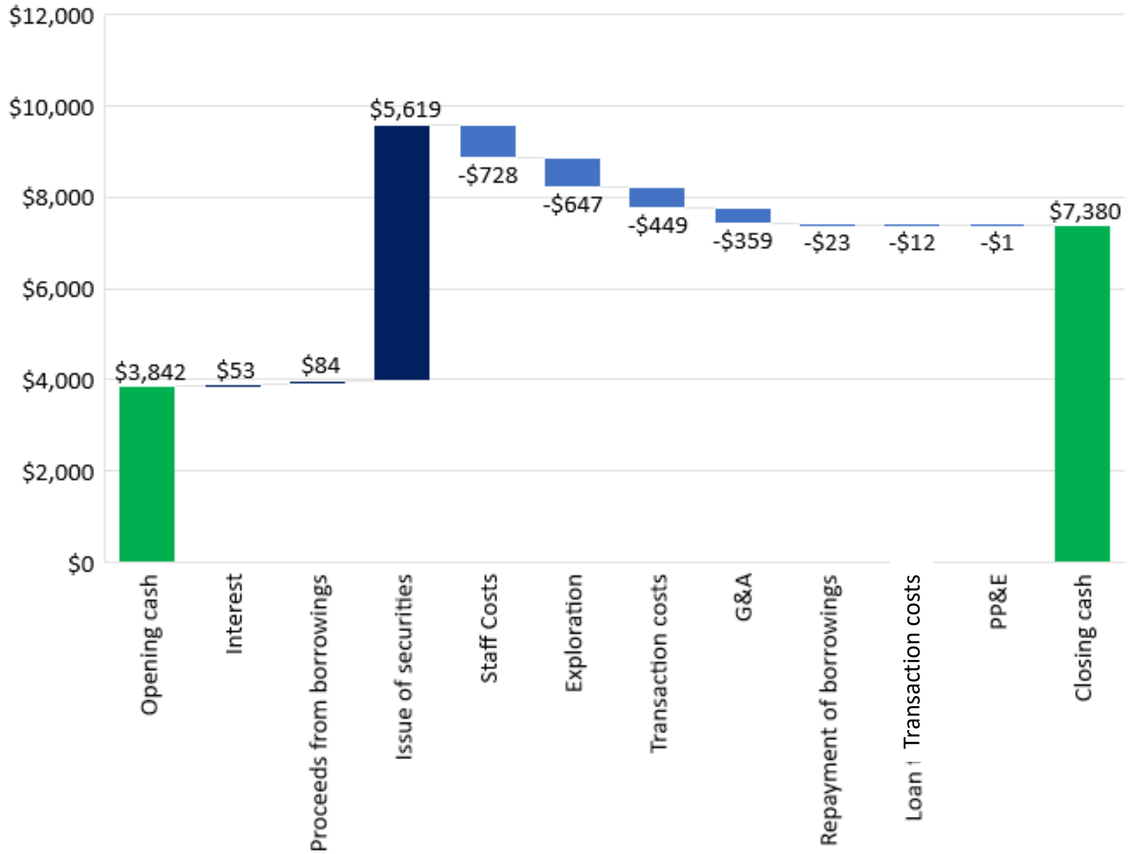
- *Leigh Creek Energy Project*
  - Pre-feasibility study
  - Upstream EIS
  - EPCM
  - Offtake agreement
- *Cooper Basin Oil & Gas Exploration*
  - Commence Farmout

FY20 Full Year Result

Maintaining a conservative balance sheet by minimising costs

- Building a strong balance sheet
  - $7.4 million in cash
  - $0.49 million R&D tax incentive receivable
  - $0.36 million drawn working capital facility
- Keeping costs low

FY20 Cash Movement ($,000)



Leigh Creek Energy Project (LCEP)

Strategic Drivers of the LCEP urea option

Higher purpose plus positive economics create a compelling strategy

- Surety of agricultural production in Australia relies on access to urea

  In Australia 20,000 farmers apply urea to more than 11 million hectares of farm land annually. Urea represents ~37% of all fertiliser used in Australia[1]. It is estimated that at least 30% to 50% of crop yield is attributable to commercial fertilizer nutrient inputs[2].

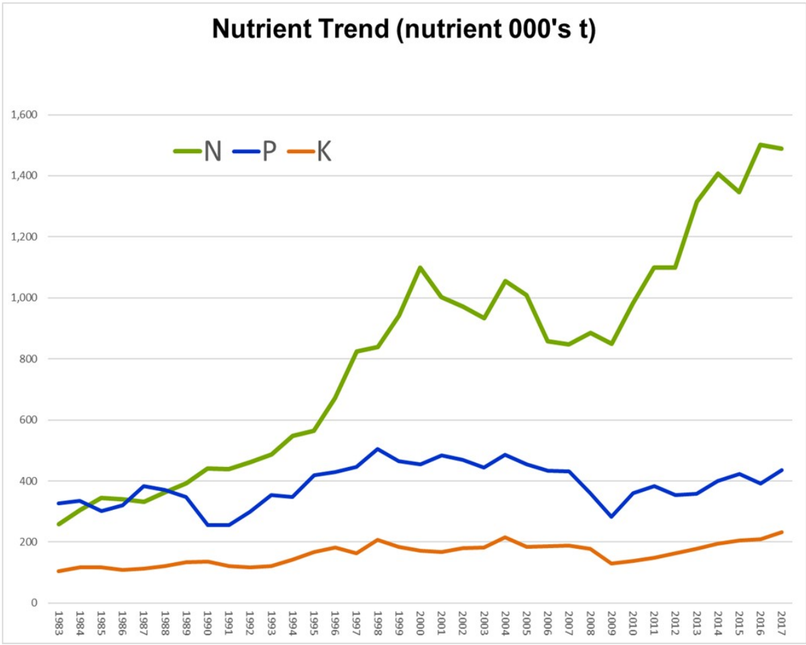
- Competitive economics compared with imported urea

  Of the 1.9Mtpa of urea used in Australia, 90% is imported[2] from the Middle East, China and Malaysia. Locally produced urea avoids the risks and costs associated with transport, exchange rates, commodity prices and import logistics

- Fully integrated urea production eliminates supply risk

  Current Australian urea manufacturers buy, rather than produce, gas

Nitrogen (N, urea), Phosphorus (P) and Potassium (K) are the primary sources of agricultural fertiliser



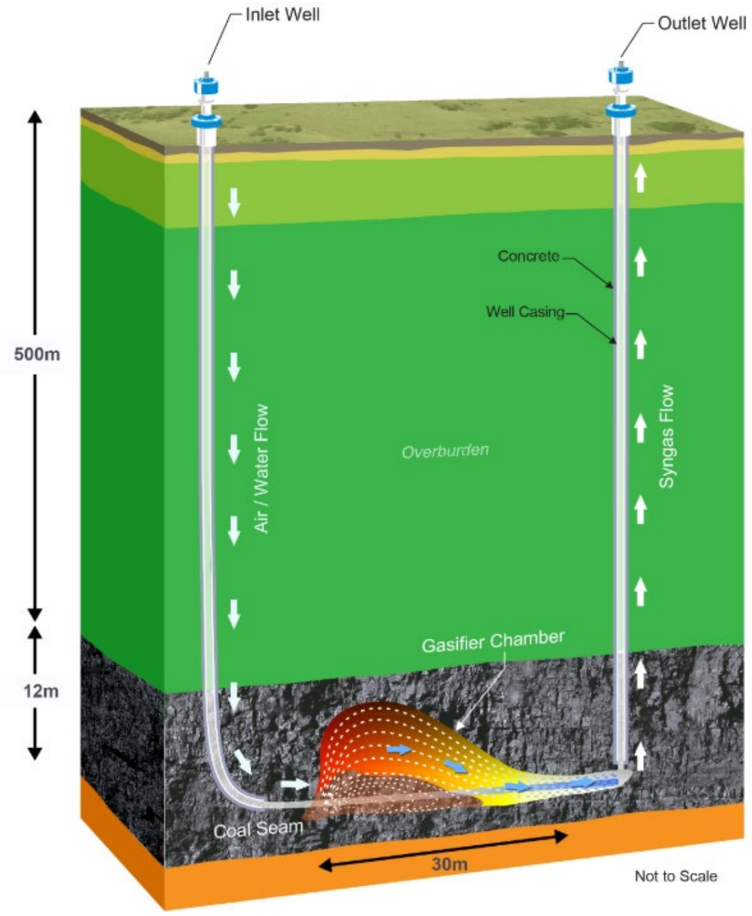
Source: Fertiliser Australia https://www.fertilizer.org.au/Fertilizer-Industry/Use-Trends

1. Source: 4627.0 - Land Management and Farming in Australia, 2016-17 https://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4627.0Main%20Features82016-17?opendocument&tabname=Summary&prodno=4627.0&issue=2016-17&num=&view=
2. Source: Fertiliser Australia https://www.fertilizer.org.au/Fertilizer-Industry/Australian-Fertilizer-Market

Leigh Creek Energy Project

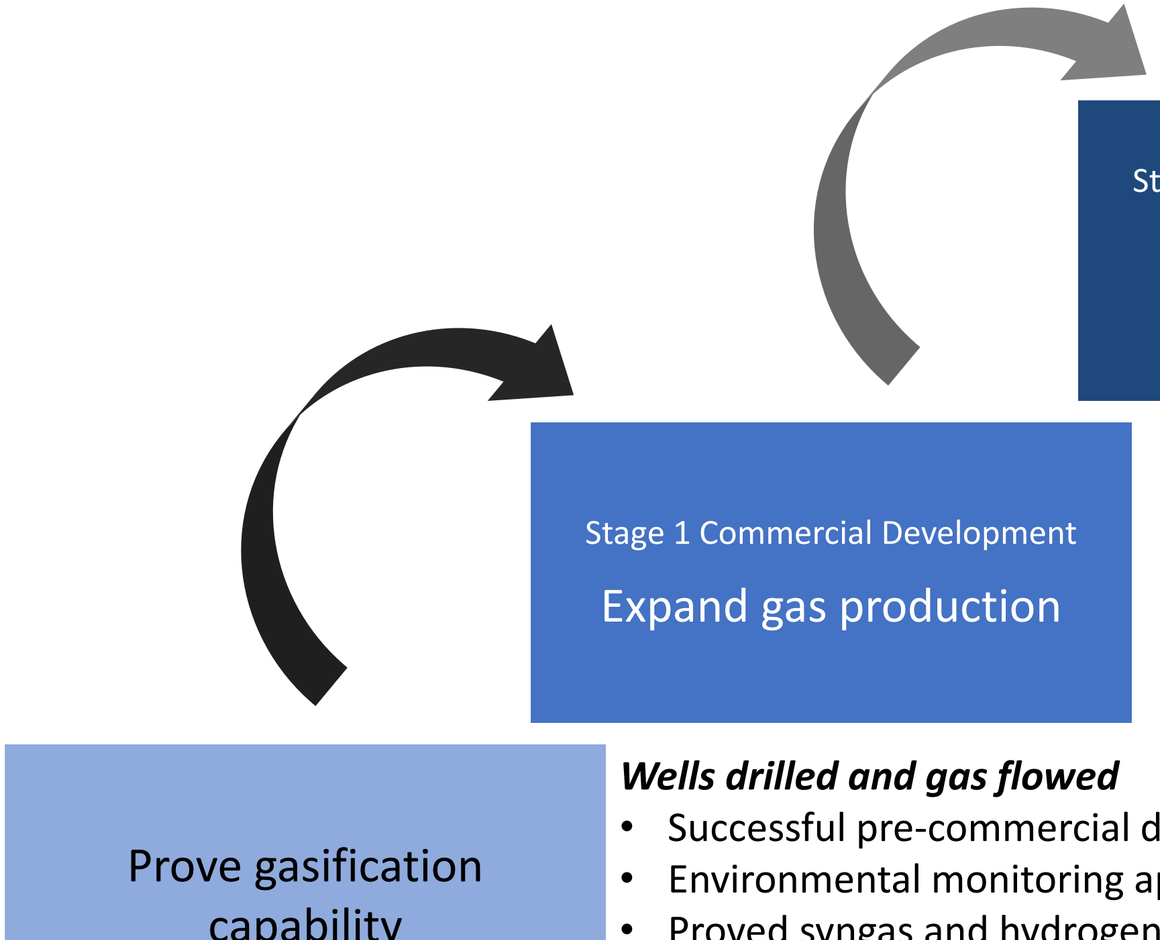
- The Leigh Creek Energy Project (LCEP) is being developed to generate syngas from coal using gasification technology
- Leigh Creek is an ideal project location as it's outside the Great Artesian Basin and has access to rail, road, air and power infrastructure
- The Leigh Creek coal field contains 1,153PJ[1] of gas reserves making it the largest uncontracted gas resource in South Australia
- The Company proved its gasification capability by successfully operating a pre-commercialisation demonstration well in 2019
- Syngas can be produced and used for urea production to supply the Australian and export market
- The Company's natural advantage is that all inputs for urea production can be sourced from on site making it potentially one of the lowest cost urea producers in the world

How coal gasification works



1 Based on 31% of the project's coal reserves

Defined Pathway to Commercial Urea Production



Commercial urea production
- 30+ further gasification wells
- 100MW gas fired power plant
- Construct urea plant
- Strategic partner

Further refinement of the gasification process
- Drill up to five more gasification wells
- 5MW gas fired power plant to power the project
- Further improve technical capability
- Confirm to stakeholders that LCK can operate multiple gasifiers

Wells drilled and gas flowed
- Successful pre-commercial demonstration (PCD) plant test completed
- Environmental monitoring approvals obtained
- Proved syngas and hydrogen production capability

Defined Pathway to Commercial Urea Production

LCEP Development Plan

Stage 1 Commercial Development

Expand gas production	PFS In Progress	PPL In Progress	EIR In Progress	EPCM In Progress	Field Development Plan In Progress	FID Planned	• Up to 5 gasification wells • 5MW power plant

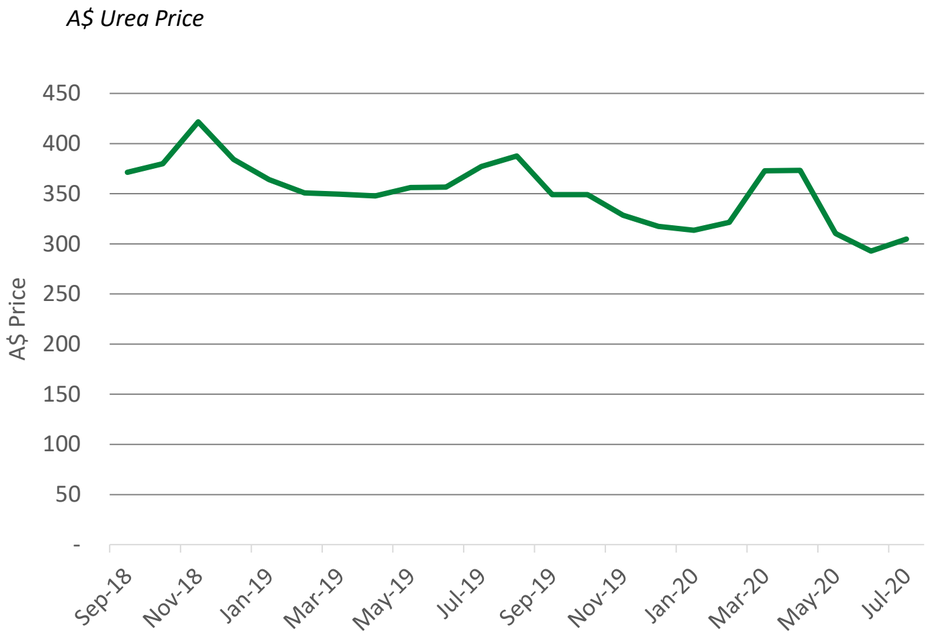
Stage 2 Commercial Development

Final large scale gas + urea production	PFS In Progress	EIS In Progress	EPCM Planned	Feasibility Study Planned	FEED Planned	FID Planned	• 30+ gasification wells • Up to 100MW power plant • Construct urea plant

LCEP Indicative Urea Production Economics

Numbers indicate potential for LCK to dominate the Australian urea market

- Thyssenkrupp modelling indicates that LCEP could sell its urea within the lowest quartile of prices charged by Gulf States producers
- Costs associated with construction and operation of the urea plant to be confirmed in the PFS in Q2 FY21
- Gas production cost approximately A$1 per GJ, approximately 35GJ required to produce one tonne of urea
- All urea production inputs sourced from Leigh Creek, reducing cost and eliminating risk
- Logistics and cost advantages compared with imported urea



Source: https://www.indexmundi.com/commodities/?commodity=dap-fertilizer&months=60&currency=aud

Other investment drivers

Cooper Basin Oil & Gas Exploration

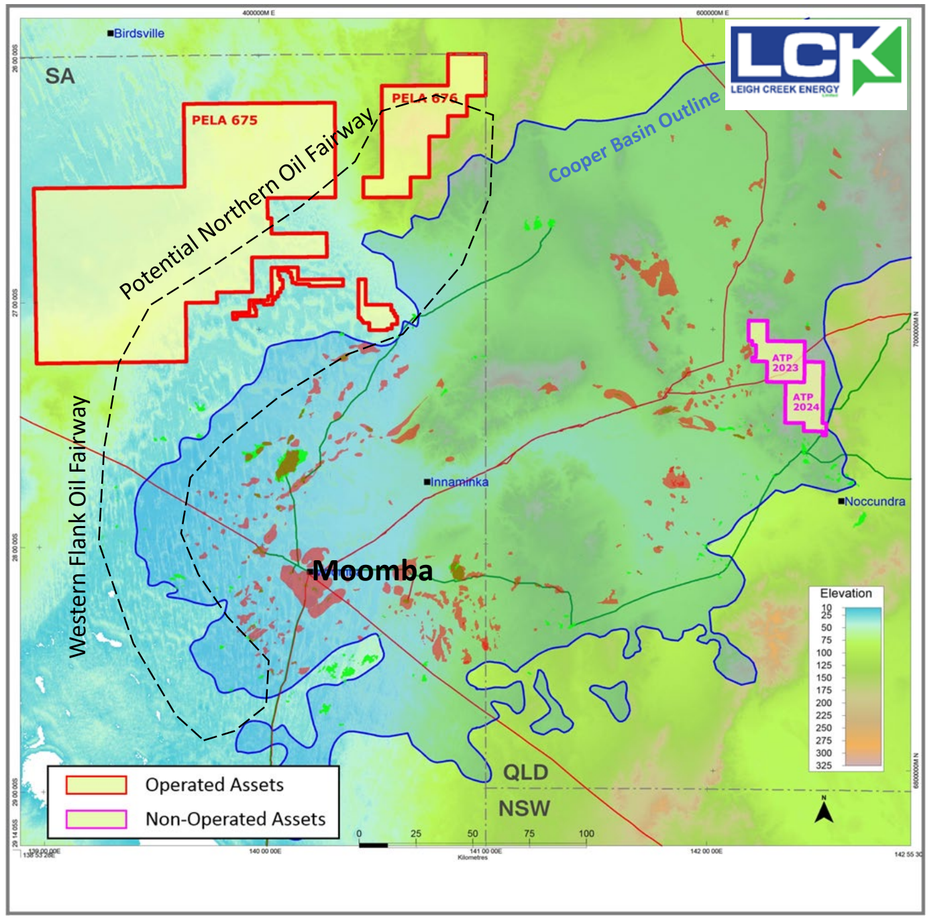
PELAs 675 & 676

- Permits awarded in the South Australian 2019 gazettal
- Stratigraphy mirrors the Western Flank Oil Fairway, targeting oil accumulations in the Birkhead Formation and Namur Sandstone
- Leads identified from existing 2D seismic, 3D seismic required to mature to drillable prospects
- Farm down process to commence in Permit Year 2

ATP 2023 & 2024

- February 2020, farm-in executed with Bridgeport Energy
- $6.34 million farm-in obligation, to acquire up to a 20% interest
- Multiple leads focused on oil in the Hutton Sandstone and gas in the Toolachee Formation

Leigh Creek Cooper Basin Oil Exploration permits



Other Potential Opportunities

Sale of hydrogen

- Increasing the pressure of air pumped into the gasification wells will result in syngas with a higher hydrogen content, lower pressure increases the methane content
- Hydrogen can be produced in vast amounts and extremely cost effectively, giving optionality
- Potential hydrogen markets are being investigated
- Support from both the Australian and South Australian Government

International consulting to other companies on gasification technology

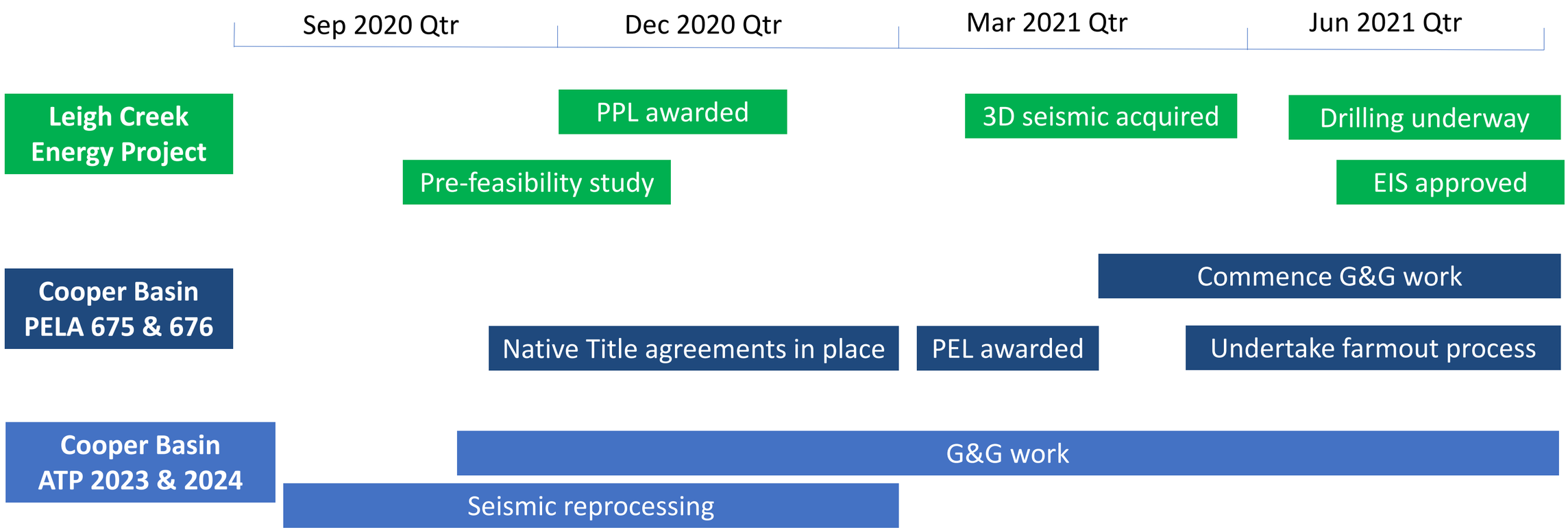
- Discussions are underway with China New Energy
- China New Energy operates a commercial hydrogen business in China [1]

The Australian Government released its National Hydrogen Strategy in November 2019

1 Through the parent company Shanxi Meijin Group

Outlook

Near Term Milestones



Long term milestone…

Urea production two years after plant construction commences

Takeaways

Leigh Creek Energy, developing responsible energy projects using innovative techniques, leaving an enduring positive legacy

- LCEP significant 2P gas reserve 1,153PJ
- Leigh Creek location advantages
- Successful demonstration completed
- Plans to become a fully integrated, low cost, urea producer
- Pre-feasibility Study for commercial urea production
- Partner sought from among the world's largest fertiliser companies
- Diversified portfolio with Cooper Basin oil exploration
- Hydrogen production optionality

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The Board of Leigh Creek Energy authorised this announcement to be given to ASX.

16 September 2020

Phil Staveley | Managing Director

Nicola Frazer | Investor Relations
Tony Lawry

Delivering on a focused strategy

Appendices

People

Executive Team

Justyn Peters, Executive Chairman (LLB, LP, BA (Politics/Jurisprudence) GDLP)

Phil Staveley, Managing Director (CPA, BA (Acc) (Hons), Dipl Btr, MAICD)

Cristian Bolda, General Manager, Operations (BCSEng (Mech), PMI, MEIAust)

Noel Whitcher, Chief Financial Officer (CA, BCom, Grad Cert HRM)

Richard Peasgood, General Manager, Commercial (MBA, MCIPS)

Noreen Byrne, General Manager, People & Sustainability (Bsc Geology & Biology, Msc Mgt HRM)

Non-Executive Directors

Greg English LLB, BE(Mining)– Non-Executive Independent Director

Murray Chatfield (B.Com (Ag) (Economics and Marketing) MBA (Cass University, London), AMCT, MAICD) - Non-Executive Independent Director

Zhe Wang - Non-Executive Director

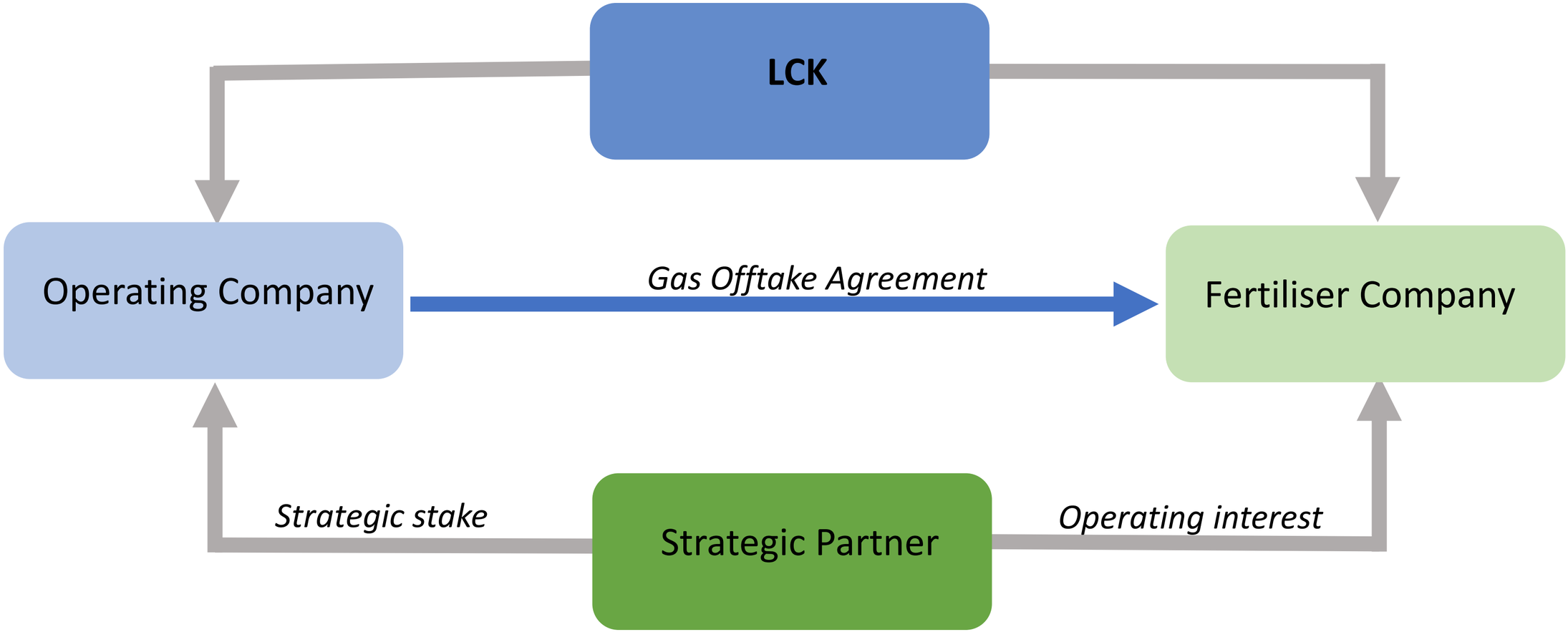
Zheng Xiaojiang - Non-Executive Director

Simpler, cheaper urea production

Production of large scale quantities of Australian made urea at bottom of global cost curve

Competitor	LCK
Purchase natural gas at ~$8/GJ Convert to syngas	Produce syngas AUD <$1/GJ
Cost of urea plant feedstock	
~A$320+/tonne	A$35/tonne
Hydrogen ⬇ Ammonia ⬇ add CO2 ⬇ Urea	
Total cost ~A$400+/tonne (ex plant)	Total cost <A$100/tonne (ex plant based on 2Mtpa)

Funding pathway progressing



LCK Hydrogen Option

Hydrogen is a pathway gas for LCK's fertiliser production

Based on LCK Report by thyssenkrupp, 2018

Hydrogen market

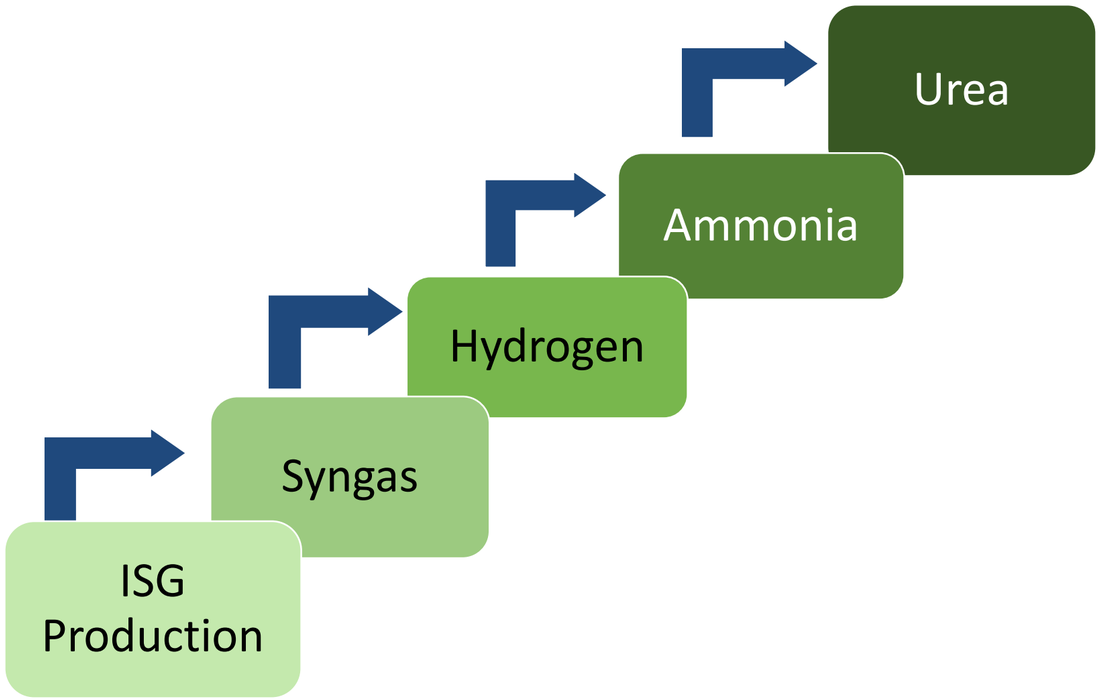
- $105B international market
- 6-8% growth pa
- Mostly industrial and niche markets
- Zero emissions fuel

Why hydrogen is attractive to LCK

- Interim product in producing fertiliser i.e. costs nothing for the optionality
- 200,000,000 kg/a at less than $1/kg
- Reduced capital expenditure, lower operating cost
- Potential for grant funding
- Option to include hydrogen production into engineering design

Carbon Neutral by 2030

- Carbon from Syngas + Hydrogen/Ammonia – Urea – Carbon reduction and offset activities = Carbon Neutrality
- Urea production requires 0.73t CO2 to produce 1t of urea(1)



(1) Based on thyssenkrupp report 2018

Carbon reduction activities are:

- ✓ Revegetation
- ✓ Renewables (pumped hydro, thermal power, solar, etc)
- ✓ Carbon Capture & Storage (Geosequestration)

Significantly reduces LCK's carbon footprint

Glossary

Abbreviation	Description
CAPEX	Capital Expenditure
CCS	Carbon Capture and Storage
CO_2	Carbon Dioxide
CRIP	Controlled Retractable Injection Point
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FID	Final Investment Decision
Gasifier	A singular gasification cavity within a panel
GJ	Gigajoule, a unit of energy, equivalent to 1 billion (109) joules
Inlet well	The well which allows for injection of oxidant and steam to the gasifier
ISG	In-situ Gasification
LCEP	Leigh Creek Energy Project
LCK	Leigh Creek Energy Limited
Outlet well	The well which allows for the exit of syngas from the gasifier to the surface plant
PCD	Pre-Commercial Demonstration
PFS	Pre-Feasibility Study
PJ	Petajoule, a unit of energy, equivalent to 1 quadrillion (1015) joules
PPL	Petroleum Production Licence
PRL	Petroleum Retention License
PRMS	Petroleum Resources Management System
SPE-PRMS	Society of Petroleum Engineers - Petroleum Resources Management System
Stage 1	Small Scale Power Plant
Stage 2	Large Scale Plant