

Leigh Creek Energy Initiation

Leigh Creek Energy Limited (LCK) is an ASX listed energy company focussed on developing its Leigh Creek Energy Project (LCEP) that is targeting the production of syngas by in situ gasification of coal which it will then convert to urea to be sold as fertiliser.

LCK forecast the LCEP will be the only fully integrated urea production facility in Australia, with all inputs for low carbon urea production on-site. Average nominal operating costs are forecast by LCK to be ~A\$109/t which will put it in the lowest quartile of the global urea production cost curve. LCK forecast the cost of feed gas to the project will be less than A\$1/giga joule (GJ) which will put it at a huge advantage to urea producers sourcing gas from the market in Australia.

Next 12-18 months will be pivotal for the LCEP

Over the next 12 months LCK will progress Stage 1 of the LCEP program targeting first commercial syngas production and power generation to demonstrate project proof of concept of the project with first power forecast to be generated by March 2022. Noting, syngas has already been produced from LCK's pre-commercial demonstration (PCD) plant trial.

LCK is also currently negotiating a heads of agreement (HOA) with DL E&C (former Daelim Industrial Co.) to progress Stage 2 of the LCEP. The work scope will include the feasibility study, front end engineering and design (FEED), engineering, procurement, construction and commissioning (EPCC) and financing for the construction of the urea manufacturing facility with a view to reaching a final investment decision (FID) in late CY2022.

Concurrently, LCK will be looking to secure an offtake agreement for the urea production so as to ensure financing can be secured.

Valuation

LCK is in the early stages of project execution and thus has a number of milestones to meet before first urea is sold into the market in 2025. Given we have assumed a 70% debt funding of project capex, LCK will require additional equity funding between now and a fully commissioned plant. Options include equity capital raises and / or partnering and a sell down of the project to fund LCK's share of the required equity contribution.

Our base case valuation assumes LCK sells down 40% of the LCEP equity at a 25% discount to our FY26 project equity value to minimise the equity funding required by existing LCK equity holders.

On this basis we value LCK at A\$1.44 in FY26 or A\$0.57 today (discounted back to today at our assumed cost of equity (Ke)).

Clearly, the percentage sold down and the discount to valuation achieved has a material impact on our LCK valuation. If we assumed a 40% sell down of the project at a 20% discount our FY26 valuation lifts to A\$1.76 with our spot valuation lifting to A\$0.69.



Leigh Creek Energy Limited (LCK) is an ASX listed energy company focussed on developing its Leigh Creek Energy Project (LCEP), located 550km north of the capital city of Adelaide in the state of South Australia. LCEP is targeting the production of syngas by in situ gasification of coal which it will then convert to urea to be sold as fertiliser.

<https://www.lcke.com.au/>

Stock	LCK.ASX
Price	A\$0.26
Market cap	A\$185m
Valuation	A\$0.57

Company data

Net cash (March 21)	A\$7.6m
Shares on issue	712.6m

Next news

Late July 2021	4Q FY21 Appendix 5B
Late August 2021	FY20 Annual Result

LCK Share Price (A\$)



Source: FactSet

David Fraser
david.fraser@mstaccess.com.au

Financial data table

Leigh Creek Energy

LCK-AU

Year end 30 June

MARKET DATA

Price	\$	0.26
52 week high / low	\$	0.27 - 0.06
Base case valuation	\$	0.57
Shares on issue (basic)	m	713
Options	m	77
Potential shares on issue (diluted)	m	790
Market capitalisation	\$m	185

12 month relative performance versus S&P/ASX Small Ordinaries



INVESTMENT FUNDAMENTALS		FY20	FY21E	FY22E	FY23E	FY24E
Reported NPAT	\$m	(7.2)	(8.4)	(9.7)	(10.7)	(12.0)
Underlying NPAT	\$m	(7.2)	(8.4)	(9.7)	(10.7)	(12.0)
EPS Reported (undiluted)	¢	(1.3)	(1.2)	(1.4)	(1.5)	(1.7)
EPS Underlying (undiluted)	¢	(1.3)	(1.2)	(1.4)	(1.5)	(1.7)
Underlying EPS growth	%	n/m	n/m	n/m	n/m	n/m
P/E Reported (undiluted)	x	n/m	n/m	n/m	n/m	n/m
P/E Underlying (undiluted)	x	n/m	n/m	n/m	n/m	n/m
Dividend	¢	0.0	0.0	0.0	0.0	0.0
Payout ratio	%	0%	0%	0%	0%	0%
Yield (Y/E/ spot)	%	0.0	0.0	0.0	0.0	0.0
Franking	%	n/a	n/a	n/a	n/a	n/a
Gross Yield (Y/E/ spot)	%	0.0	0.0	0.0	0.0	0.0

KEY RATIOS		FY20	FY21E	FY22E	FY23E	FY24E
Year end shares	m	655	713	713	713	713
Market cap (Y/E / Spot)	\$m	43.9	185.3	185.3	185.3	185.3
Net debt /(cash)	\$m	(6.3)	(5.1)	(5.5)	(5.7)	790.4
Enterprise value	\$m	37.6	180.1	179.7	179.6	975.6
EV/Sales	x	n/m	n/m	424.1	105.9	575.6
EV/EBITDA	x	n/m	n/m	n/m	n/m	n/m
EV/EBIT	x	n/m	n/m	n/m	n/m	n/m
Net debt / Enterprise Value	x	(0.2)	(0.0)	(0.0)	(0.0)	0.8
Gearing (net debt / EBITDA)	x	n/m	n/m	n/m	n/m	n/m

Operating cash flow per share	¢	0.2	(0.8)	(1.1)	(1.2)	(1.3)
Price to operating cash flow	x	42.0	n/m	n/m	n/m	n/m

Free cash flow	\$m	(1.9)	(7.6)	(39.0)	(18.4)	(1,180.8)
Free cash flow per share	¢	(0.3)	(1.1)	(5.5)	(2.6)	(165.7)
Price to free cash flow	x	n/m	n/m	n/m	n/m	n/m

Project assumptions

2P Gas reserves (PJ)	1,153
2C Gas resource (PJ)	1,469
2P Reserve percentage of project coal reserves	31%
Indicated and inferred coal resource (Mt)	301
Syngas production (PJ p.a.) FY26	35

Forecast capital expenditure (A\$b)	2.63
Stages 1 & 2	2.28
Year 17 & 18	0.35
Assumed gearing (Debt to Assets)	70.0%

CASH FLOW (\$'000) (Appendix 4C)	3Q20	4Q20	1Q21	2Q21	3Q21
Receipts	\$m	0.0	0.0	0.0	0.0
Grants, interest & other	\$m	0.0	0.1	0.0	0.5
Total cash receipts	\$m	0.0	0.1	0.0	0.5
Staff costs	\$m	(0.7)	(0.7)	(0.7)	(0.7)
Admin costs	\$m	(0.6)	(0.4)	(0.5)	(0.8)
Cash operating costs	\$m	(1.4)	(1.1)	(1.2)	(1.5)
PPE	\$m	(0.1)	(0.0)	0.0	0.0
Exploration & Evaluation	\$m	(0.5)	(0.6)	(0.7)	(0.3)
Net investing and financing	\$m	(0.6)	(0.6)	(0.6)	(0.3)
Share issuance	\$m	1.7	5.6	0.0	0.1
Other	\$m	0.0	0.0	0.0	0.0
Net financing	\$m	1.9	5.2	0.1	(0.5)
Net cash movement	\$m	(0.0)	3.5	(1.8)	(1.8)
Cash Q End	\$m	3.8	6.8	5.0	3.3

PROFIT AND LOSS		FY20	FY21E	FY22E	FY23E	FY24E
Sales	\$m	0.0	0.0	0.4	1.7	1.7
Operating costs	\$m	0.0	0.0	(0.3)	(1.0)	(1.0)
Gross profit	\$m	0.0	0.0	0.2	0.7	0.7
Other income	\$m	0.1	0.1	0.1	0.1	0.1
Share based payments	\$m	(0.9)	(1.1)	(1.2)	(1.2)	(1.5)
Total operating costs	\$m	(6.1)	(7.2)	(8.4)	(9.2)	(10.2)
EBITDA	\$m	(7.0)	(8.2)	(9.3)	(9.6)	(10.9)
Depreciation & amortisation	\$m	(0.1)	(0.2)	(0.5)	(1.1)	(1.1)
EBIT	\$m	(7.0)	(8.4)	(9.8)	(10.7)	(12.0)
Net interest	\$m	(0.1)	0.0	0.0	0.0	0.0
Associate earnings	\$m	0.0	0.0	0.0	0.0	0.0
Impairments	\$m	0.0	0.0	0.0	0.0	0.0
Pretax Profit	\$m	(7.2)	(8.4)	(9.7)	(10.7)	(12.0)
Tax expense	\$m	0.0	0.0	0.0	0.0	0.0
Minorities	\$m	0.0	0.0	0.0	0.0	0.0
NPAT	\$m	(7.2)	(8.4)	(9.7)	(10.7)	(12.0)

BALANCE SHEET		FY20	FY21E	FY22E	FY23E	FY24E
Cash	\$m	6.8	5.1	5.5	5.7	8.7
Receivables	\$m	0.6	0.2	0.2	0.2	0.2
Inventory	\$m	0.0	0.0	0.0	0.0	0.0
Other	\$m	0.1	0.1	0.1	0.1	0.1
Current assets	\$m	7.5	5.5	5.9	6.1	9.0
PPE	\$m	0.4	0.4	24.9	23.8	1,194.2
Exploration and evaluation	\$m	27.2	29.2	35.2	45.2	45.2
Right of use asset	\$m	0.2	0.2	0.2	0.2	0.2
Intangibles	\$m	0.0	0.0	0.0	0.0	0.0
Other	\$m	0.6	0.6	0.6	0.6	0.6
Non current assets	\$m	28.4	30.4	60.9	69.9	1,240.2
Total Assets	\$m	35.9	35.9	66.8	75.9	1,249.2
Accounts Payable	\$m	0.5	0.5	0.5	0.6	0.6
Borrowings	\$m	0.5	0.0	0.0	0.0	0.0
Other	\$m	0.6	0.8	0.9	1.0	1.1
Current liabilities	\$m	1.6	1.3	1.4	1.6	1.7
Borrowings	\$m	0.1	0.0	0.0	0.0	799.1
Lease liabilities	\$m	0.1	0.1	0.1	0.1	0.1
Other	\$m	0.0	0.0	0.0	0.0	0.0
Non current liabilities	\$m	0.2	0.1	0.1	0.1	799.2
Total Liabilities	\$m	1.8	1.4	1.6	1.7	800.9
Equity	\$m	81.1	87.7	129.2	148.7	547.3
Retained earnings	\$m	(51.0)	(59.3)	(69.1)	(79.8)	(91.7)
Reserves / Other	\$m	4.1	6.1	5.1	5.3	(7.2)
Shareholder's equity	\$m	34.2	34.5	65.3	74.2	448.4

CASH FLOW		FY20	FY21E	FY22E	FY23E	FY24E
EBITDA	\$m	(7.0)	(8.2)	(9.3)	(9.6)	(10.9)
Add back share compensation	\$m	0.9	1.1	1.2	1.2	1.5
Change in working capital	\$m	0.0	0.9	0.1	0.0	0.1
Cash flow pre interest and tax	\$m	(6.0)	(6.2)	(8.1)	(8.4)	(9.3)
Net interest	\$m	0.0	0.0	0.0	0.0	0.0
Tax paid / Refund / Other	\$m	6.9	0.6	0.0	0.0	0.0
Operating cash flow	\$m	0.9	(5.5)	(8.0)	(8.4)	(9.3)
Stage 1 development	\$m	(0.0)	(0.1)	(25.0)	0.0	0.0
Stage 2 development	\$m	(2.7)	(2.0)	(6.0)	(10.0)	(1,172)
Other	\$m	0.0	0.0	0.0	0.0	0.0
Investing cash flow	\$m	(2.8)	(2.1)	(31.0)	(10.0)	(1,171.5)
Change in Equity	\$m	10.4	6.6	41.5	19.5	398.6
Increase / (decrease) in borrowings	\$m	(3.4)	(0.4)	0.0	0.0	799.1
Dividend / Other	\$m	(0.6)	(0.3)	(2.1)	(1.0)	(14.0)
Financing cash flow	\$m	6.4	5.9	39.4	18.5	1,183.7
Change in Cash	\$m	4.5	(1.7)	0.4	0.2	3.0

Source: Company data, MST Access

Investment Thesis:

We are initiating on Leigh Creek Energy Limited (LCK) with a base case valuation of \$0.57.

LCK is an ASX listed energy company focussed on developing the Leigh Creek Energy Project (LCEP), located 550km north of Adelaide in South Australia. LCEP is targeting the production of syngas by in situ gasification (ISG) of underground coal which it will then convert to urea to be sold as fertiliser.

Global demand for urea

The world's population is expected to increase by 2 billion people in the next 30 years, from 7.7 billion to 9.7 billion. With a growing population comes an increase in demand for agricultural produce with farmers needing to produce more, using less land and less water. Every time a crop is harvested, vital nutrients are removed from the soil. Applying urea is the most common way to replace these nutrients. Commercial fertilisers increase yields by 30 to 50% in crops such as wheat, barley and rice.

Urea is one of the most popular fertilisers as it has a high nitrogen content (one tonne of urea contains 460 kg of nitrogen), is easy to transport and apply and is quickly absorbed by plants.

In Australia 20,000 farmers apply urea to more than 11 million hectares of land annually consuming approximately 2 Mtpa. Of the 2 million tonnes of urea used in Australia each year, 95% is imported from the Middle East and Asia.

How will LCK meet the global demand for urea?

Leigh Creek Energy's (LCK) flagship project is the Leigh Creek Energy Project (LCEP). It is proposed the LCEP will initially produce 1 Mtpa of urea (with the potential to increase to 2 Mtpa) from a dedicated facility at a low cash cost using syngas sourced from its wholly owned resources.

LCEP plans to send granular urea by rail and sea to domestic markets. Excess urea outside of the main demand seasons in Australia will be exported overseas.

LCK competitive advantages

We believe LCEP urea will be globally competitive because:

- LCEP will be a low-cost producer - LCEP operating costs will be very competitive as it forecasts it can produce syngas (mixture of methane (CH₄), hydrogen (H₂), carbon monoxide (CO) and carbon dioxide (CO₂)) on site for as little as A\$1 per gigajoule, putting the project in the lowest cost quartile of global urea producers.
- The inputs for urea production are on-site - Urea operations are proposed to be vertically integrated as gas and electricity will be produced on site. This eliminates commodity and supply risks associated with buying gas and power for urea production
- LCEP will have a reliable supply of syngas - Syngas has been successfully produced at LCEP using in-situ gasification (ISG) during the project's pre-commercial demonstration phase. Leigh Creek geology is ideally suited for ISG due to the nature of the coal resource and local geology.
- It has 30+ years of gas reserves - Exploration and production permits have 1,153 PJ of 2P gas reserves based on 31% of the project's coal resources of 301.2 Mt coal. The reserves are sufficient to operate a 1Mtpa urea plant for 30 plus years.
- LCEP has access to infrastructure - The Leigh Creek site has access to existing road and rail infrastructure for transport to domestic and export markets. LCK believe that LCEP urea will be competitive in the wholesale Australian market as it will be cheaper, faster and less risky for urea traders than importing it from the Middle East and Asia. LCEP plans to export a proportion of its urea to take advantage of both the autumn-winter Australian season and the spring-summer Asian market. Ports accessible from Leigh Creek are central to the main Australian urea markets.

Forecast near term activities and share performance catalysts

The timelines below show LCK's commercial development milestones for its upstream and downstream development plans.

During the March quarter 2021, the Final Investment Decision (FID) was approved for Stage 1 of the LCEP

The recent execution of the heads of agreement (HOA) with the South Korean engineering and construction company, DL E&C Co, to agree terms on the feasibility Study, front end engineering and design (FEED), engineering, procurement, construction and commissioning (EPCC) programs has advanced LCK's LCEP project. Once the agreement has been settled and DL E&C commences work, these milestones will be in progress.

Figure 1 – LCEP proposed timeline comprises two key development workstream stages

Stage 1 Commercial Development

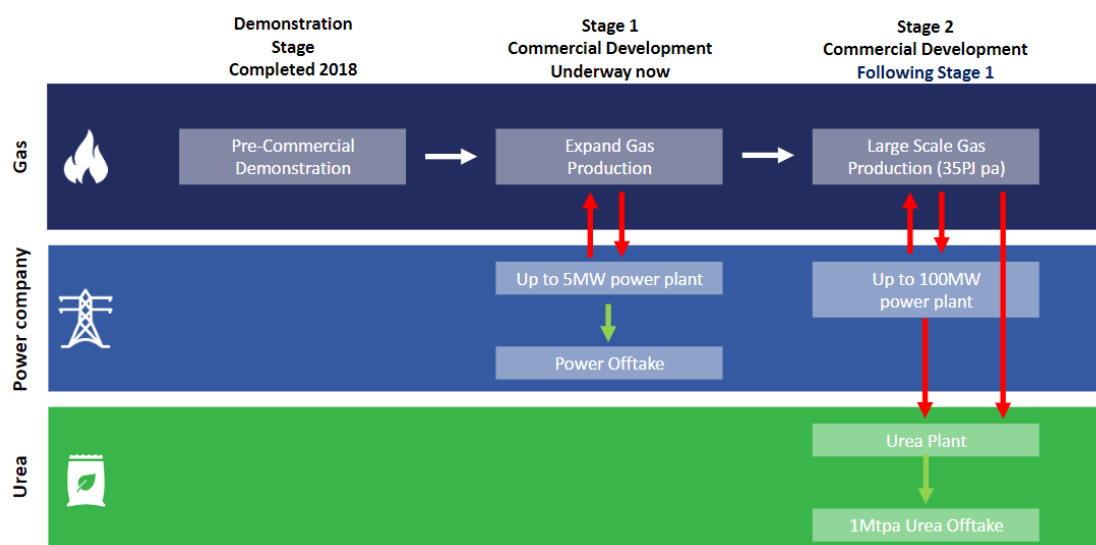


Stage 2 Commercial Development



Source: Company

Figure 2 – LCEP development pathway



Source: Company

Stage 1 - Initial syngas production and small-scale power generation

During the March quarter 2021, the Final Investment Decision (FID) was approved for Stage 1 of the LCEP.

Stage 1 comprises drilling further wells, generating syngas and installing a small power plant to use the gas. Once the Stage 1 wells have been drilled, the gasifiers will be initiated and developed to produce syngas. The syngas will be fed into the small power plant and the electricity generated will be used to power electric driven compressors and the balance will be monetised by selling into the grid or directly to an end user. This process will avoid using diesel generators and flaring ramp up gas which will minimise CO₂ generation and reduce operating costs.

Following FID approval, the Company commenced its EPCM work program and procurement of long lead time items, such as electricity generators casing and compressors. As part of Stage 1 work programs, drilling services have been awarded to inGauge Energy, an Australian onshore drilling and completions project company.

Figure 3 – LCEP proposed timeline

Quarter	March 2021	June 2021	September 2021	December 2021
Stage 1 Commercial Development	Power Generators Acquired		3D Seismic Acquired	Drilling Investigation/ Monitoring Wells
	EPCM Appointment			Drilling Production Wells
	FID Approval		EIS approved	Power Plant / Infrastructure Construction

Source: Company

The scope of inGauge's engagement includes:

- Investigating options for well design and integrity measures based on the LCK gasifiers design
- Managing approval requirements in conjunction with LCK
- Procurement (tender scope, specifications, recommendation and assistance) of drilling contractors
- On site drill operations management

Prudentia has been awarded the engineering and design contract and will manage selection, engineering, construction and commissioning of above ground facilities.

The scope of Prudentia's engagement includes:

- Technology selection, engineering and design development
- Development of documents, specifications, and drawings for use with procurement and construction activities
- Development and tracking of project controls including schedule and budget
- Development of scope of work packages and management of procurement activities
- Construction and commissioning support

LCK has an established relationship with inGauge and Prudentia, as both companies worked on the 2018 pre-commercial demonstration project.

As part of Stage 1, LCK has prepared the Environmental Impact Report (EIR) and Statement of Environmental Objectives (SEO) for the Leigh Creek Energy Project Stage 1 Commercial Development on Petroleum Production Licence 269.

EIR submission: <https://www.lcke.com.au/Portals/87/Content/Documents/2020/LCKE-EIR-Stg-1-Comcl-Develpmnt-20201222.pdf>

SEO submission: <https://www.lcke.com.au/Portals/87/Content/Documents/2020/LCKE-SEO-Stg-1-Comcl-Develpmnt-20201222.pdf>

LCK has formally submitted the reports for assessment to the South Australian Department of Energy and Mining (DEM).

Stage 2 – Large scale syngas and urea production

LCK has entered into a binding Heads of Agreement (HOA) with the South Korean engineering and construction company, DL E&C Co., Ltd. (part of the DL Group) to exclusively negotiate terms of a proposed agreement for the Feasibility Study, front end engineering and design (FEED) and engineering, procurement, construction and commissioning (EPCC) of the urea manufacturing facility.

DL E&C is a leading global engineering, procurement and construction contractor with deep technical expertise and corporate capability to partner with LCK. DL E&C has successfully completed more than 600 projects of construction, civil engineering, and plant projects in 35 countries worldwide

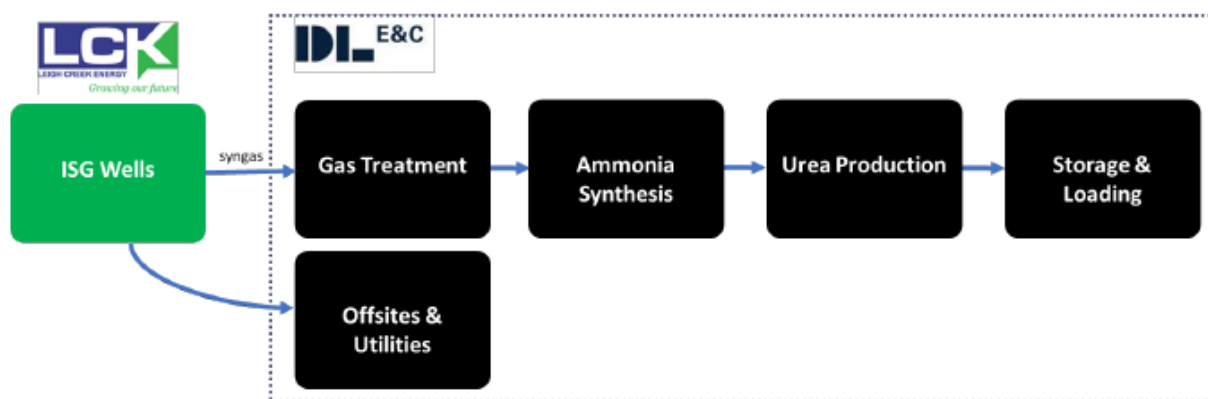
The binding HOA grants DL E&C Co an exclusive right to negotiate the terms & conditions of the proposed agreement by 31 May 2021. Under the HOA, DL E&C and LCK agree to settle the Agreement terms by which DL E&C will become the EPCC contractor. Under the Agreement it is intended DL E&C will be contracted for the FEED stages, the EPCC contract and the start-up.

Additionally, DL E&C with LCK's assistance will arrange the required finance for the turnkey price of the urea manufacturing facility from mainly Korean financial institutions. The intention is that LCK will retain 100% ownership of the LCEP; i.e. LCK will not sell down to DL & EC as part of this agreement. As stated earlier and assumed in our valuation, we forecast LCK will need to sell down a stake in the LCEP or find a corner stone investor to provide equity.

Scope of Work

The HOA gives exclusivity to DL E&C to settle the EPCC contract terms and conditions with LCK under the Agreement. The contract scope covers the Feasibility Study and FEED and the EPCC on a turnkey lump sum basis. Financing for the components of the LCEP will be broadly allocated between LCK and DL E&C per the diagram below.

Figure 4 – Financing responsibilities for LCEP



Source: Company

We estimate that for a scope of work like this, the engineering company will typically be paid ~1.5% - 2.0% of the forecast project cost. Based on a forecast LCEP construction capital expenditure number of A\$2.25b, this equates to A\$34m – A\$45m. This would likely be split:

- 15% on signing (A\$5m – A\$7m), FY22
- 25% on signing of final investment decision (A\$9m – A\$11m), FY23, and
- the balance (A\$21m – A\$27m) on project construction completion, FY25.

Funding requirements over the next 24 months

Corporate overheads

Cash corporate overheads, exploration and evaluation costs have been running at ~A\$2.1m per quarter over the last couple of years, so circa A\$8.0m per annum. Given new hires and a step up in work associated with Stage 1 and Stage 2 progression we have assumed corporate costs will move up to ~A\$10m in the medium term.

Stage 1

We forecast ~A\$25m will be required to fund a number of gasification wells, associated production plant and the purchase of a small power plant (up to 5 Megawatt (MW)) to demonstrate project proof of concept.

Stage 2

We forecast up to ~A\$18m will be required to fund the first two milestone payments for the Stage 2 feasibility study to be carried out by DL E&C in FY22 and FY23.

Thus, in total over FY22 and FY23 we forecast LCK will need to source funding of ~A\$60m.

LCK completed a \$6.5m capital raise (\$6m post fees) by way of a placement to Energy Exploration Capital Partners (EECP) in January 2021. EECP has granted LCK an unilateral option to place an additional \$13m of shares to EECP to raise and additional \$12m net of fees.

Thus, based on our forecasts LCK will need an additional ~\$50m, assuming the EECP option is exercised.

Valuation

LCK is in the very early stages of project execution and thus has a number of milestones to meet before first urea is sold into the market in 2025. Given we have assumed a 70% debt funding of project capex, LCK will require additional equity funding between now and a fully commissioned plant. Options include equity capital raises and /or partnering and a sell down of the project to fund LCK's share of the required equity contribution.

Our base case valuation assumes LCK sells down 40% of the LCEP equity at a 25% discount to our project equity value to minimise the equity funding required by existing LCK equity holders.

On this basis we value LCK at A\$1.44 in FY26 or A\$0.57 today (discounted back at our assumed cost of equity (Ke) of 20%.

Clearly, the percentage sold down and the discount to valuation achieved has a material impact on our LCK valuation. If we assumed a 40% sell down of the project at a 20% discount our FY26 valuation lifts to A\$1.76 with our spot valuation lifting to A\$0.69.

Risks to our forecasts and valuation

Key risks to our financial forecasts and valuation include:

- Capital cost of the project and project delays.
- Regulatory approvals.
- Technical success and urea production rate being achieved.
- Company and project funding.
- Competition from new and existing players.
- Global urea pricing.
- Foreign exchange rates impacting urea pricing and A\$ sales.
- Raw feed costs – successful operation of gasifiers and syngas composition.
- Risk of adverse events, product quality or other safety issues.
- Key management personnel and employees.
- General economic conditions impacting on urea demand.

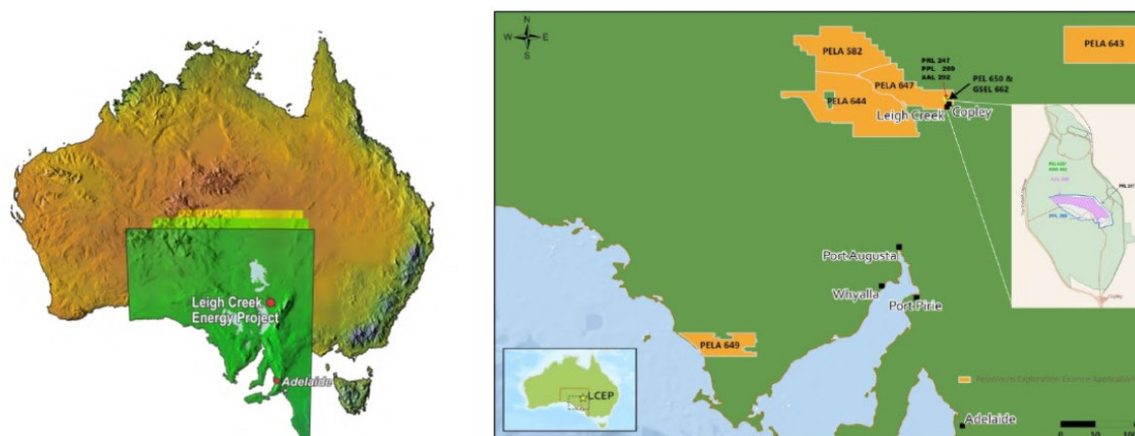
Leigh Creek Energy Overview

Leigh Creek Energy Limited (LCK) is an ASX listed energy company.

Its key focus is on developing its Leigh Creek Energy Project (LCEP), located 550km north of the capital city of Adelaide in the state of South Australia. LCEP is targeting the production of syngas by in situ gasification (ISG) of coal which it will then convert to urea to be sold as fertiliser. The LCEP sits within the existing but now dis-used, Leigh Creek Coalfield and will develop deep resources that are unable to be mined. Syngas will be produced from the resource that is no longer economic to mine using a process known as in-situ gasification, or ISG and this syngas will be used to produce urea fertiliser.

LCK also has a number of other conventional oil and gas activities (see Appendix 4), which we have not focussed on in this report as we deem them immaterial at this stage.

Figure 5 – LCEP located in south Australia

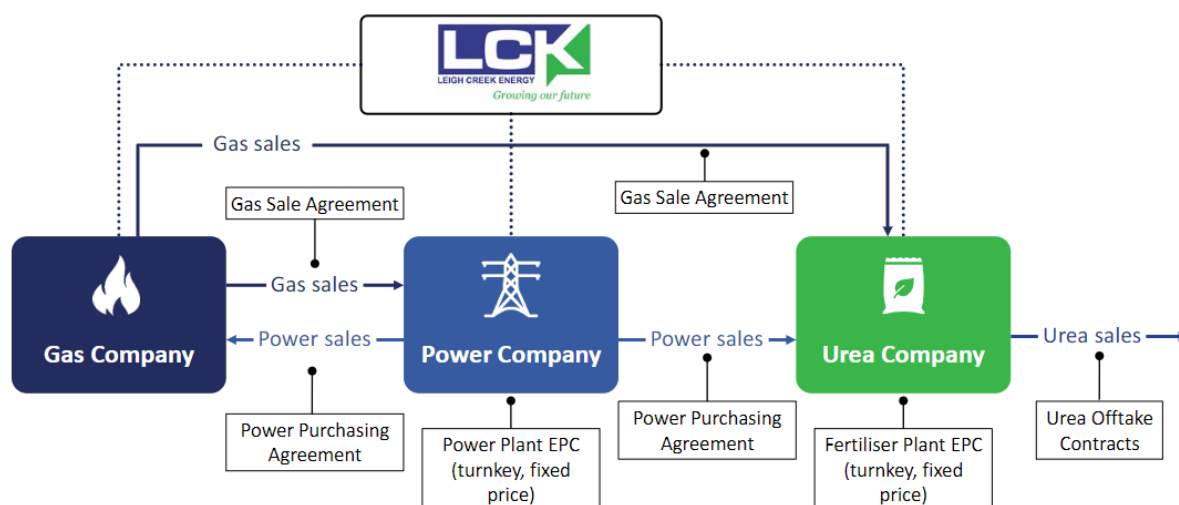


Source: Company

The current proposal is to structure the LCEP as per below, thus giving LCK the opportunity to sell down partially or in entirety the gas power or urea companies.

Figure 6 – LCK proposed corporate structure

All relationships controlled under contractual agreements



Source: Company

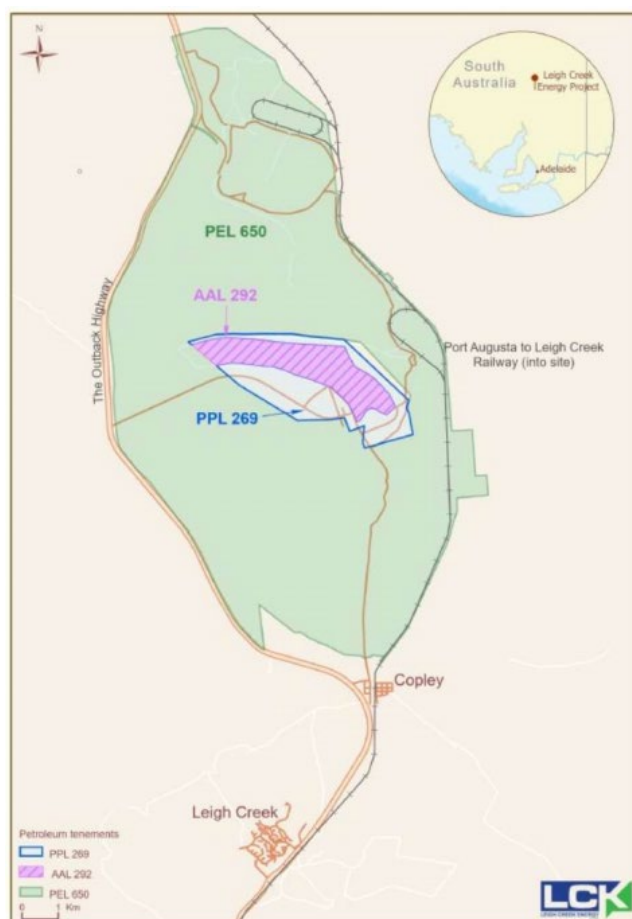
Leigh Creek Energy history

- August 2015 – Leigh Creek Energy Limited listed via a reverse takeover.
- December 2015 – 377 Mt coal inferred resource reported in accordance with the Joint Ore Reserves Committee (JORC) Code within the previously announced 220 – 530 Mt exploration target.
- April 2018 – South Australia government lodges review granting LCKs in-situ gasification plant trial.
https://www.petroleum.sa.gov.au/_data/assets/pdf_file/0004/273073/20180418_-_Summary_of_Leigh_Creek_Energy_Information.pdf
- April 2018 - Received Statement of Environmental Objectives (SEO) approval for the Pre-Commercial Demonstration (PCD) stage of the Leigh Creek Energy Project (LCEP) from the South Australia Regulator and was approved by the Minister for Mining and Energy.
- October 2018 – Conclusion of legal proceedings initiated on behalf of the Adnyamathanha Traditional Lands Association (ATLA). The application for a review and injunction of the decision by the Department for Energy and Mining to allow the Company to operate under an existing Statement of Environmental Objectives was dismissed.
- October 2018 – Pre-Commercial Demonstration (PCD) plant operational with first syngas produced
- January 2019 - PCD plant reported 89 days of continuous production and syngas with up to 20% methane (CH₄)
- March 2019 - 1,153PJ (1.1Tcf) 2P reserve certified by independent PRMS consulting engineer
- August 2019 - PCD plant and operations compliance confirmed
- September 2019 - The thyssenkrupp Concept Select Study on ISG to fertiliser for LCK finalised.
- June 2020 – 12 months of site monitoring completed after PCD operations resulting in no groundwater contamination issues, no air quality issues and no surface subsidence.
- June 2020 - Department for Energy and Mining granted the company a Petroleum Retention Licence (PRL) for LCEP.
- November 2020 – Preliminary Feasibility Study released.
- November 2020 - Issued with a Petroleum Production Licence (PPL) and an Associated Activities Licence (AAL) by the South Australian Government for the Leigh Creek Energy Project (LCEP)
- December 2020 – Executes joint venture agreement (JVA) with China New Energy Group Limited to provide in-situ gasification (ISG) project management and consultancy services.
- January 2021 – \$6m equity placement to Energy Exploration Capital Partners (EECP) with the option of EECP providing an additional \$12m
- January 2021 – EPCM contracts awarded for Stage 1 of the LCEP
- March 2021 – Final investment decision for Stage 1 to proceed with initial syngas production and small-scale power generation.
- May 2021 - Binding Heads of Agreement (HOA) with DL E&C Co., Ltd to exclusively negotiate terms of a proposed agreement for the Feasibility Study, FEED and EPCC of the urea manufacturing facility.

LCK reserves and resources

LCK (through wholly owned subsidiary Leigh Creek Operations Pty Ltd) holds Petroleum Exploration License (PEL) 650, PPL 269, Petroleum Retention License (PRL) 247 and Associated Activities License (AAL) 292, which covers an area of 93 km² over the Leigh Creek Coalfield, and Gas Storage Exploration Licence (GSEL) 662 which covers the same area.

Figure 7 – LCK licenses



Source: Company

In March 2019, LCK received a PRMS certification of 1,153 PJ 2P at the Leigh Creek Energy Project (LCEP) from MHA Petroleum Consultants, based in Denver, USA. The classification was a direct result of the success of the Pre-Commercial Demonstration Plant (PCD) at the LCEP, where the PCD produced all targeted commercial gases with commercial flow rates from a single gasifier. The 2P reserve certification confirms that the gas at the LCEP is of considerable value and has been independently certified as suitable for a commercial project, and now represents one of Eastern Australia's largest undeveloped and uncontracted gas reserves.

LCK's 2P resource of 1,153 PJ (1.1Tcf) gas reserves are located within PEL 650 and PRL247 of the Telford Basin near the town of Leigh Creek, South Australia. According to the Australian Competition and Consumer Commission (ACCC) analysis of Australian gas reserves and resources, LCK's reserves within the LCEP are approximately the same size, on a 2P reserve basis, as the entire Cooper Basin.

LCK's PRMS assessment (i.e. Reserve certification) is expected to increase over time as more information about the project and the recoverable petroleum products are established. This additional information will be derived from a variety of sources, such as further drilling, seismic work, and production testing. Therefore, there is additional opportunity for future reserve upgrades of the 2C contingent resource figures to capture the resources contained in the upper series and lower series coal seams.

Process to produce Urea ($\text{CH}_4\text{N}_2\text{O}$)

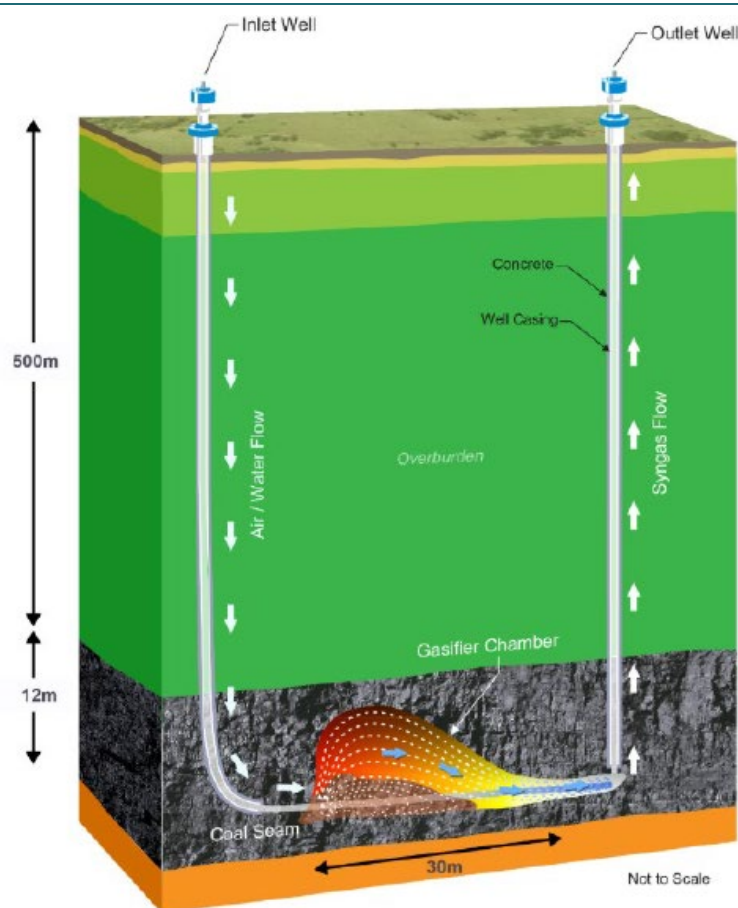
What is in situ gasification (ISG)

ISG is another way of describing underground coal gasification (UCG). UCG is an industrial process which converts coal into product gas, carried out in non-mined coal seams using injection of oxidants and steam. The product gas called syngas is brought to the surface through production wells drilled from the surface.

How does the ISG process work?

The ISG process converts coal, through a number of chemical reactions (oxidation then reduction then pyrolysis) (See Appendix 3), from its solid state into a gaseous form, resulting in the generation of syngas. Syngas comprises methane, hydrogen and carbon monoxide energy gases with variable amounts of inert gases, carbon dioxide and nitrogen.

Figure 8 - The in situ gasification process



Source: Company

1. Outlet well is drilled to intersect coal seam.
2. Inlet well is drilled and steered to link up with Outlet well.
3. Initiation tool is placed down the inlet well to heat the coal and starts the gasification process.
4. Addition of air and water creates a series of chemical conversions transforming coal to syngas.
5. Process is controlled by using inlet and outlet wells to manage the flow of air and water
6. Syngas will flow up through the outlet well and is analysed on the surface.
7. Process is stopped by turning off air and water supply from the inlet well.

Benefits of ISG

ISG is not a new technology or process, and because it has successfully operated in many demonstration sites and commercial operations in several countries over many decades, its benefits are well documented. ISG has many advantages, including:

- Small surface disturbance: above ground facilities can be easily located away from sensitive areas without impacting access to targeted reserves. The need for above ground plant, production, or refinement facilities, or for solid waste handling and disposal operations is eliminated because ash, char, and other solid residual materials from the gasification process remain underground.
- Safe working environment: Only small amounts of equipment goes underground, not people and machines.
- Groundwater protection: ISG can be conducted at depths well below fresh water and in saline water.
- Waste minimisation: ISG eliminates much of the energy waste associated with moving waste rock.
- Reduction in greenhouse emissions: ISG produces less greenhouse gas than conventional mining and has the potential for subsurface geologic CO₂ storage.
- Low capital and operating costs: No surface gasification facilities are needed.
- Optimising resources: Able to extract energy from coal that is deep or uneconomic to mine.
- Efficient process: Small physical footprint for very large amounts of energy extraction and produces energy (synthesis gas) efficiently relative to other coal extraction and natural gas production techniques.

Producing urea from syngas

The most common way of producing granular urea is to convert natural gas from methane as follows:

- Methane in the syngas is converted to hydrogen
- Nitrogen and hydrogen are mixed at high pressure and temperature to form ammonia (NH₃)
- The ammonia is then reacted with carbon dioxide to form a liquid urea solution;

Figure 9 – Chemical reactions converting syngas to urea

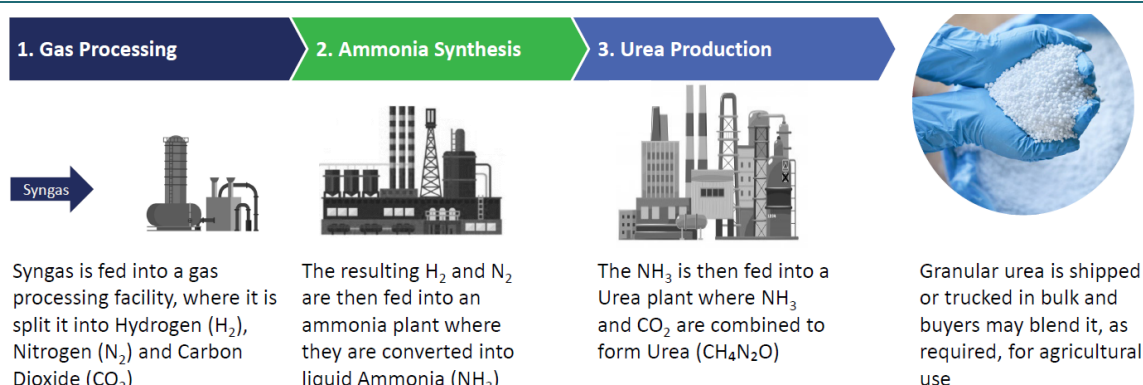
Description	Reaction
Methane plus steam converted into H ₂ and carbon monoxide (CO)	$\text{CH}_4 + \text{H}_2\text{O} \rightleftharpoons 3\text{H}_2 + \text{CO}$
Reformation of methane (using CO) into water (H ₂ O) and CO ₂	$\text{CH}_4 + 2\text{CO} \rightleftharpoons 2\text{H}_2\text{O} + \text{CO}_2$
Combustion of H ₂ , convert to H ₂ O	$2\text{H}_2 + \text{O}_2 \rightleftharpoons 2\text{H}_2\text{O}$
CO converted into H ₂ and CO ₂	$\text{CO} + \text{H}_2\text{O} \rightleftharpoons \text{H}_2 + \text{CO}_2$
H ₂ and air are fed into the ammonia synthesis unit for conversion to ammonia gas (NH ₃)	$3\text{H}_2 + \text{N}_2 \rightleftharpoons 2\text{NH}_3$
Ammonia from the ammonia synthesis unit is combined with compressed CO ₂ and fed to the urea synthesis plant for conversion to urea (CH ₄ N ₂ O) and H ₂ O	$2\text{NH}_3 + \text{CO}_2 \rightleftharpoons \text{CH}_4\text{N}_2\text{O} + \text{H}_2\text{O}$

Source: Company

- The urea solution is then fed through a granulation plant to form a granular urea product which is usually white round spheres 2-4mm in diameter.

The process for the LCEP is similar though, the syngas LCEP produces is higher in hydrogen than natural gas, so has a different process to create the hydrogen mix. The stages after that are identical.

Figure 10 – LCEP proposed manufacturing process



Source: Company

Global fertiliser and urea market

Granular urea is traded globally as a homogenous product. The granular urea market is a fragmented industry, with close to 300 prominent producers globally. 220 Mtpa of urea is produced globally. Of this approximately 50 Mtpa is internationally traded. Some of the top global urea traders include Yara, Ameropa, KOCH, and Transammonia.

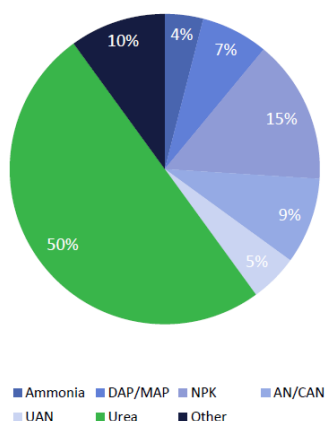
Key urea supply influences are seasonal demand, access to suitable port and sea freight, and gas prices (low in the Middle East). The capital cost of constructing a urea plant we believe is a key barrier to entry. Demand for urea is influenced by factors such as rainfall, crop mix, price, subsidy schemes, regulation and innovation.

Figure 11 – Global fertiliser and urea demand continues to grow

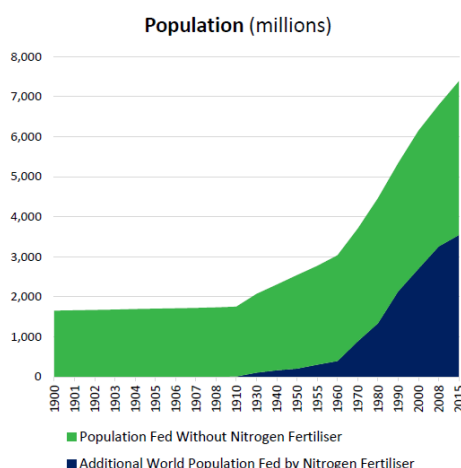
Global urea demand is driven by the need to expand crop production volumes

- Nitrogen based fertilisers improve crop **quantity** while Phosphorus and Potassium fertilisers improve crop quality
- Over half of all Nitrogen fertiliser is sold as urea
- Nitrogen fertiliser has an ammonia base, ammonia is difficult to store and transport, so it is processed into a granular state, for transportation
- Urea fertiliser sales in Australia are ~2Mtpa¹, representing less than 2% of global sales, 95% of Australia's urea is imported

Urea Represents half of all Nitrogen fertiliser products



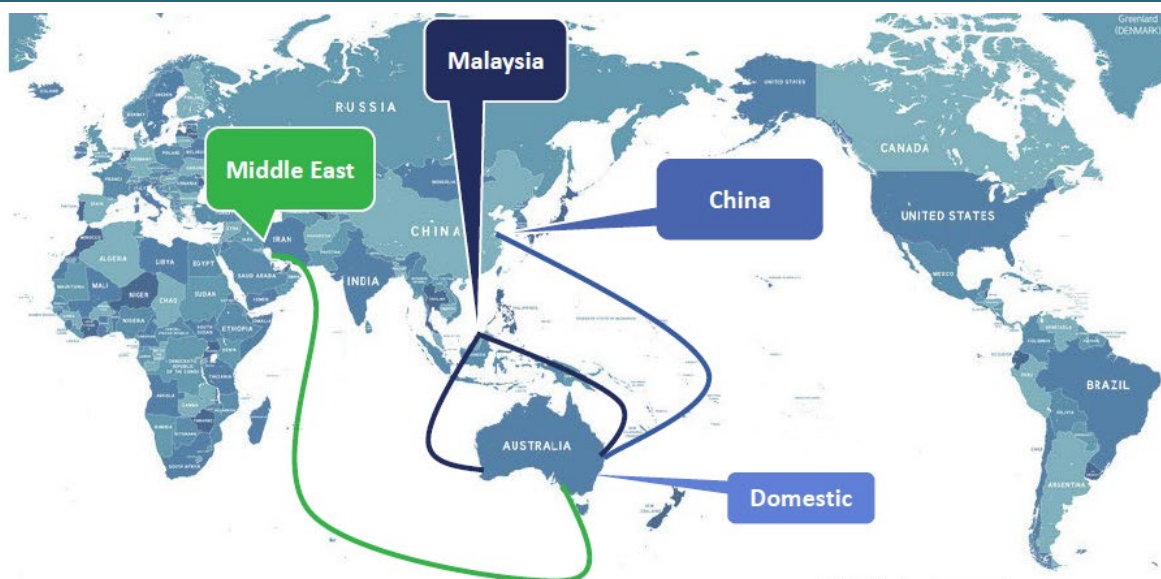
Nitrogen fertiliser feeds half the world's population¹



Source: Company

95% of Australia's urea is imported from Asia and the Middle East. On average it takes 24 days to ship urea to Australia from the Middle East and it costs approximately A\$30/t to do so. The remaining ~5% of fertiliser used in Australia is domestically produced using increasingly expensive east coast gas as raw feed.

Figure 12 – 95% of Australia's urea is imported - Where does it come from?



Source: Company

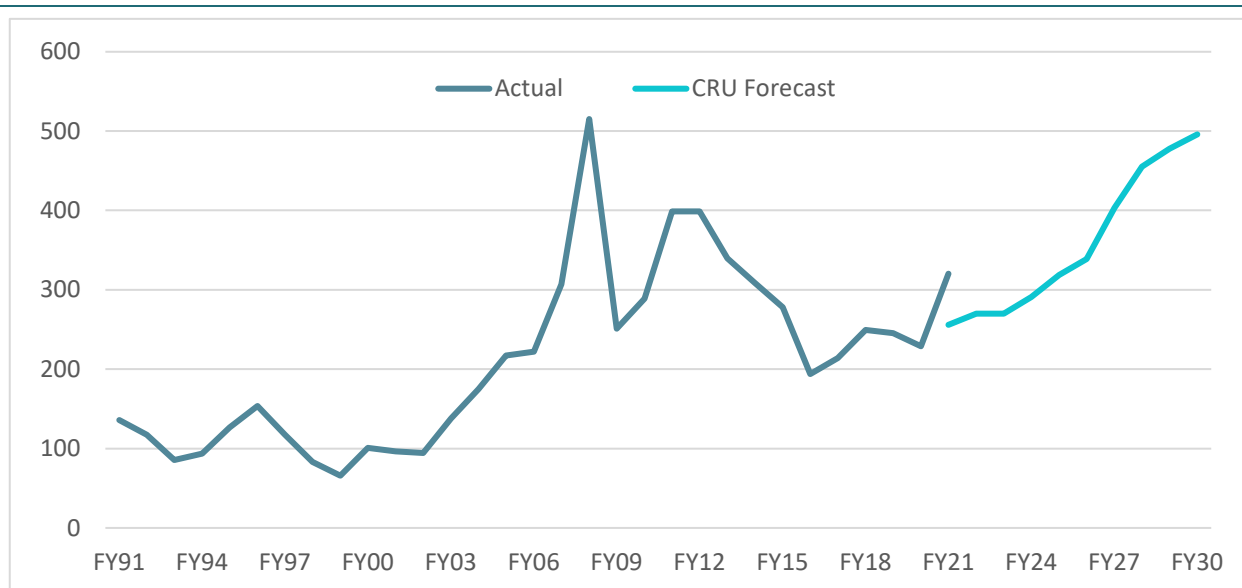
Urea has averaged ~US\$210/t since 1991. Over the last 10 years the average annual price has ranged from US\$200/t to US\$500/t.

CRU who provided urea prices to LCK forecast the urea price will be US\$500/t (~A\$640/t) by 2030.

Current granular urea (free on board (FOB) Middle Eastern June 2021 pricing is US\$366.50/t or ~A\$470/t.

Source: <https://www.cmegroup.com/trading/agricultural/fertilizer/urea-granular-fob-middle-east.html>

Figure 13 – Urea pricing and CRU forecasts out to 2030 used in PFS



Source: Company, IndexMundi

Leigh Creek Energy Financial Forecasts

The initial stage of the LCEP included the commissioning, operation and decommissioning of a demonstration plant (Pre-Commercial Demonstration (PCD)). The small-scale in situ gasification (ISG) demonstration plant (completed over 2018 and 2019) was to obtain information to inform the design for a potential commercial facility.

This demonstration facility involved the construction of an above ground plant (and associated service infrastructure) and the establishment of a below ground single ISG gasifier chamber. The demonstration plant successfully produced syngas, proving out the technical and environmental performance of the process.

Given both Stage 1 and Stage 2 of the project are at pre-production we have based our forecasts on the preliminary feasibility forecasts provided by the company that were produced using information from the PCD in conjunction with the concept study completed by thyssenkrupp.

Thyssenkrupp Concept Study and Preliminary Feasibility Study (PFS)

LCK engaged thyssenkrupp to undertake a Concept Select Study for the LCEP which was completed in late 2019. In the last decade thyssenkrupp has constructed and commissioned 14 new fertiliser plants with a total annual urea capacity of almost 12 Mt.

The study was a key component of LCK's commercialisation plans, confirming operating and associated ongoing costs for the production of fertiliser products. It followed the successful completion of the PCD which successfully produced a flow rate in excess of 1 Tcf p/d from a single gasifier.

The key design concept was that the LCEP will provide syngas into its fertiliser plant for a fraction of the cost of current natural gas producers. Nitrogen based fertilisers are produced from gas feedstock. This is generally from pipeline quality natural gas, which is then converted to synthesis gas (syngas) to produce ammonia (NH₃) which is then converted to urea by the addition of carbon dioxide (CO₂). In the traditional process of manufacturing urea companies buy natural gas and then convert that gas to syngas. LCK provides a significant cost advantage as the ISG process product gas is syngas. The LCEP has effectively backward engineered global fertiliser production by providing the required syngas feedstock from the ground in situ (the disruptive process), which is then converted to urea by the addition of carbon dioxide (CO₂).

By way of example, approximately 40 GJ of gas is used to produce 1 t of urea in a conventional process. At current Australian gas costs if a producer was able to acquire gas at \$8/GJ it would have a gas cost of \$320/t for gas feedstock which they would then convert to syngas at an extra cost. In comparison LCK forecast it will be able to provide syngas feedstock at less than A\$1.00/GJ. NB: We have assumed a gas price of A\$3.60/GJ for royalty calculations.

LCK estimate the typical all up costs ex plant for a tonne of urea using conventional gas is ~A\$400/t of urea whereas thyssenkrupp estimate LCK will be able to produce urea at A\$109/t.

As a check Yara, the global operator that engages in the production, distribution, and sale of fertilisers, has kindly provided a cash cost forecast model on its website to calculate the total cash cost ex works of urea.

<https://www.yara.com/investor-relations/analyst-information/calculators/ammonia-and-urea-cash-cost/>

For a gas price of US\$8.00/mmbtu (~A\$10.00/GJ) the cash cost of producing granulated urea is US\$251/t or ~A\$320/t.

Even at these levels LCK will have a material pricing advantage particularly given its proximity to markets.

The \$1.00/GJ cost is based on LCK being able to produce commercial syngas from its 2P PRMS reserve, and includes all costs such as drilling, well head, casing, compression, peripheral equipment, gathering systems, separation, cleaning gas plus operating expenditure for the gasifier operation.

The estimated capital cost from thyssenkrupp for development of a 1.0 M tpa plant is A\$2.6bn. Linking this to the LCEP's feedstock syngas at less than A\$1.00/GJ, thyssenkrupp estimate LCK will be able to produce urea at A\$109/t

This compares favourably to the current published urea spot price for the region of US\$335/t (A\$430/t).

Source: <https://www.indexmundi.com/commodities/?commodity=urea&months=240>

This would put the LCEP on par with the world's lowest cost urea producers, Saudi Arabia and Russia. LCEP will also have a significant cost advantage over the current Australian domestic production and also compares favourably to recently announced plants, e.g. Perdaman's recent announcement of a \$4bn, 2 Mtpa urea plant with natural gas as the feedstock.

<https://perdaman.com.au/2020/07/01/4-5bn-karratha-urea-project-agrees-epc-terms/>

For exports, this significant cost advantage in production will allow the LCEP to compete favourably in local export markets with the lowest cost producers globally who have similar ex plant costs but higher transport costs into Asia Pacific markets.

Following the concept study release in September 2019 LCK released its preliminary feasibility study (PFS) in November 2020.

Key findings and assumptions of the PFS are tabled below:

Figure 14 – Preliminary Feasibility Study assumptions and findings for a 1 Mtpa urea production project

Project assumptions						
Petroleum retention license	PRL 269	Initial capital cost (FY18)			2,600	
Petroleum retention license	PEL 650	Stage 1 & 2			2,250	
2P Gas reserves (PJ)	1,153	Year 17 & 18			350	
2C Gas resource (PJ)	1,469	LCK pre tax NPV ₉			3,400	
Percentage of project coal reserves	31%	Pre-tax internal rate of return			30%	
Indicated and inferred coal resource (Mt)	301	Payback period (Years)			4.0	
Forecast Capex (A\$m)		FY23	FY24	FY25	FY39	FY40
Urea production capex		693	693	693		
Syngas production capex		68	68	68	175	175
Debt funding		50%				
Cost of debt (Kd)		6.0%				
Project life (years)		30.0				

Source: Company

LCK have used urea price forecasts from CRU (CRU Group is a privately owned business intelligence company. The company focuses on the global mining, metals and fertiliser markets) and have assumed a 30-year project post construction completion.

Figure 15 – Preliminary Feasibility Study macro assumptions

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Urea pricing US\$/tonne	270	270	291	319	339	403	455	478	496	508
AUDUSD	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Urea pricing A\$/tonne	380	380	410	449	477	568	641	673	698	716
Urea production (Mtpa)	0.0	0.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Syngas production (PJ p.a.)	0.0	0.0	17.5	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Total Royalties (% of gas sales)	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%

Source: Company

Forecast construction completion is 31 December 2024 with the first six months of production in FY25 and the first year of full production in FY26.

Figure 16 – Preliminary Feasibility Study forecast cash flows

A\$m	Jun-23	Jun-24	Jun-25	Jun-26	Jun-27	Jun-28	Jun-29	Jun-30	Jun-31	Jun-32
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Urea sales	0	0	205	449	477	568	641	673	698	716
Royalties	0	0	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
Net income	0	0	193	437	465	556	629	661	686	704
Labour	0	0	(8)	(17)	(18)	(18)	(19)	(19)	(20)	(20)
Insurance	0	0	(7)	(14)	(14)	(14)	(15)	(15)	(15)	(15)
Maintenance	0	0	(27)	(55)	(56)	(58)	(59)	(60)	(62)	(64)
Fresh water	0	0	(2)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Catalysts	0	0	(5)	(10)	(10)	(10)	(10)	(10)	(11)	(11)
Chemicals & Syngas	0	0	(11)	(23)	(23)	(25)	(25)	(26)	(26)	(27)
Total operating costs	0	0	(60)	(124)	(126)	(130)	(133)	(135)	(139)	(142)
EBITDA	0	0	133	313	339	426	496	526	547	562
Funding										
Urea production capex	(693)	(693)	(693)	0	0	0	0	0	0	0
Syngas production capex	(68)	(68)	(68)	0	0	0	0	0	0	0
Project cash flow	(762)	(762)	(629)	313	339	426	496	526	547	562
Debt raised	381	381	381	0	0	0	0	0	0	0
Loan repayments	0	0	(15)	(15)	(16)	(17)	(18)	(19)	(21)	(22)
Net debt movement	381	381	366	(15)	(16)	(17)	(18)	(19)	(21)	(22)
Pre tax cash flow	(381)	(381)	(263)	299	322	410	478	506	526	539

Source: Company

LCK estimated from its PFS that the LCEP generated would generate a pre-tax internal rate of return (IRR) of 30% and has a pre-tax NPV₉ of \$3.4b based on a total capital cost of \$2.6b producing 1 Mtpa of urea.

MST financial forecasts for the LCEP

For our base case modelling we have used forecasts provided by the LCK PFS, CRU and thyssenkrupp.

The key differences we have used in our modelling are:

- A higher USDAUD cross rate of 0.78 versus 0.71 in PFS. Spot AUDUSD cross rate is 0.774.
- Price inflation of 2.5% versus various in the PFS.
- Average weekly earnings inflation of 3.5% versus 2.75% in the PFS.
- Assumed gas price for royalty calculation of A\$3.55/GJ inflating at 2.5% where royalties are ~9% of implied gas sales, comprising South Australian royalties (yet to be finalised) and existing overriding royalties.
- First production of urea in FY26 versus 2H25.
- Urea pricing as per CRU forecasts. NB: Current spot price US\$328/t (~A\$424/t) is marginally above our model forecast of A\$409/t in FY26.
- Capital expenditure of A\$2.3b over FY24 and FY25 rather than spread over FY23 to FY25 with A\$350m to be spent on new gasifiers in FY42 and FY43 (Years 17 and 18).
- Debt funding of capital works of 70% versus 50% in the PFS.
- Debt to be interest only and to roll at set term levels before starting to amortise in FY45 (Year 23).
- Debt funding at 5.0% interest rate versus PFS interest rate of 6.0%.
- Straight line depreciation over 30-year project life.
- Tax losses available of ~A\$130m by FY25.
- From late FY22 we have assumed a 5 MW power plant sells electricity into the South Australian (SA) grid at \$43/MWh (CY2020 average SA power price) (FY sales of ~\$1.7m) and is cash flow positive until 2025 when the LCEP starts production.
- We have assumed granular urea is sold at the plant gate. Rail infrastructure from Leigh Creek to Port Pirie and Adelaide exists. Based on a rail freight cost of \$0.04 / net tonne km (NTK) we estimate the cost of railing urea to port could be from A\$13/t (350 km to Port Pirie) to A\$20/t (550 km to Adelaide).

We table below our model assumptions and financial forecasts for the LCEP.

Figure 17 – MST Forecast LCEP Macro assumptions (Years 1-10 of 33 shown)

A\$m	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Forecast Capex		FY24	FY25	FY39	FY40					
Urea production capex		1,039	1,039							
Syngas production capex		102	102	175	175					
Urea price increases	2.5%	0.0%	7.8%	9.5%	6.2%	19.1%	12.9%	5.0%	3.7%	2.6%
Urea pricing US/tonne	270	270	291	319	339	403	455	478	496	508
Discount / (Premium)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Model input	270	270	291	319	339	403	455	478	496	508
PFS AUDUSD	0.710									
AUDUSD	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780
Urea pricing A\$/tonne	346	346	373	409	434	517	583	613	635	652
Inflation	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Average weekly earning (AWE) inflation	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Urea production (Mtpa)	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Source: Company, MST Access

The key difference between our forecasts and the LCK PFS is our A\$ urea price given the stronger AUDUSD cross rate. We have also assumed the royalty charge will appreciate over time with an inflating gas price assumption. NB: The royalty payments have yet to be finalised with the South Australian government.

Please note we have included the LCK PFS forecasts in blue.

Figure 18 – MST Forecast LCEP Profit and Loss (including LCK PFS forecasts) (Years 1-10 of 33 shown)

	Jun-23	Jun-24	Jun-25	Jun-26	Jun-27	Jun-28	Jun-29	Jun-30	Jun-31	Jun-32
A\$m	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Urea sales	0	0	0	409	434	517	583	613	635	652
Royalties	0	0	0	(12)	(12)	(13)	(13)	(13)	(14)	(14)
Net income	0	0	0	397	422	504	571	599	622	638
Urea sales (LCK PFS)	0	0	205	449	477	568	641	673	698	716
Royalties (LCK PFS)	0	0	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
Net Income (LCK PFS)	0	0	193	437	465	556	629	661	686	704
Operating costs										
Labour	0	0	0	(17)	(18)	(18)	(19)	(20)	(20)	(21)
Insurance	0	0	0	(14)	(14)	(15)	(15)	(15)	(16)	(16)
Maintenance	0	0	0	(55)	(57)	(59)	(61)	(63)	(65)	(68)
Fresh water	0	0	0	(5)	(5)	(5)	(5)	(6)	(6)	(6)
Catalysts	0	0	0	(10)	(10)	(11)	(11)	(11)	(11)	(12)
Chemicals & Syngas	0	0	0	(23)	(24)	(24)	(25)	(25)	(26)	(27)
Total operating costs	0	0	0	(124)	(128)	(132)	(136)	(140)	(144)	(149)
EBITDA (LCK PFS)	0	0	187	313	339	426	496	526	547	561
EBITDA	0	0	0	273	294	373	435	459	477	489
Depreciation	0	0	0	(76)	(76)	(76)	(76)	(76)	(76)	(76)
EBIT	0	0	0	197	218	297	359	383	401	413
Net interest	0	0	0	(84)	(84)	(84)	(84)	(84)	(84)	(84)
PBT	0	0	0	113	134	212	275	299	317	329
Accounting tax	0	0	0	(34)	(40)	(64)	(82)	(90)	(95)	(99)
NPAT	0	0	0	79	94	149	192	209	222	230

Source: Company, MST Access

Based on our forecasts the LCEP requires equity funding of \$684m in FY24 and FY25.

Our calculated post tax, post debt amortisation equity internal rate of return (IRR) is 30%.

Figure 19 – MST Forecast LCEP Cash Flows (Years 1-10 of 33 shown)

A\$m	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
EBITDA	0	0	0	273	294	373	435	459	477	489
Net cash interest	0	0	0	(84)	(84)	(84)	(84)	(84)	(84)	(84)
Cash tax	0	0	0	0	(35)	(64)	(82)	(90)	(95)	(99)
Operating cash flow	0	0	0	189	175	225	268	285	298	306
Syngas production capex	0	(102)	(102)	0	0	0	0	0	0	0
Urea production capex	0	(1,039)	(1,039)	0	0	0	0	0	0	0
Net investing	0	(1,142)	(1,142)	0	0	0	0	0	0	0
Debt draw down	0	799	799	0	0	0	0	0	0	0
Debt amortisation	0	0	0	0	0	0	0	0	0	0
Net Financing	0	799	799	0	0	0	0	0	0	0
Cash flow available to equity	0	(342)	(342)	189	175	225	268	285	298	306
Equity IRR		30%								

Source: Company, MST Access

LCEP equity valuation

We have calculated a discounted cash flow valuation for the LCEP project at the Year 4 (FY26).

At this stage it is assumed the plant has been fully constructed and the project has A\$1,681m of debt (A\$1,598m of drawn debt and A\$83m of capitalised interest).

Figure 20 – MST Forecast LCEP Debt

	Jun-23	Jun-24	Jun-25	Jun-26	Jun-27	Jun-28	Jun-29	Jun-30	Jun-31	Jun-32
A\$m	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Debt										
Percentage capex debt funded	70%									
Debt beginning	0	0	820	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Draw down	0	799	799	0	0	0				
Sub total	0	799	1,619	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Capitalised	0	20	63	0	0	0	0	0	0	0
Amortised	0	0	0	0	0	0	0	0	0	0
Debt end	0	820	1,681	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Average debt	0	410	1,250	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Cost of debt	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Interest	0	20	63	84	84	84	84	84	84	84
Implied Kd		5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

Source: : Company, MST Access

We have assumed an equity beta for the project using an asset beta of 1.0. We note Yara International (YAR-OSL), the globally listed fertiliser manufacturer, has an equity beta of 0.75. Post de-levering gives an implied asset beta for Yara of 0.67. Given our forecast 70% debt to enterprise value (EV) our derived equity beta is 2.69 and our cost of equity (Ke) is 20%.

Our calculated WACC based on a risk-free rate (Rf) of 4.0%, expected market return of 10.0%, net debt to EV of 70%, tax rate of 30% and debt premium over Rf of 1.0% is 8.5%.

Figure 21 – MST Forecast LCEP DCF Valuation (Years 4 – 12 of 33 shown)

	Jun-26	Jun-27	Jun-28	Jun-29	Jun-30	Jun-31	Jun-32	Jun-33	Jun-34
A\$m	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
EBITDA	273	294	373	435	459	477	489	500	512
Forecast cash tax	0	(35)	(64)	(82)	(90)	(95)	(99)	(102)	(106)
Movement in Working Capital	0	0	0	0	0	0	0	0	0
Capital Expenditure	0	0	0	0	0	0	0	0	0
Capital Raised	0	0	0	0	0	0	0	0	0
Net Cashflow	273	259	309	352	370	382	390	398	406
FCF Timing Factor	1	2	3	4	5	6	7	8	9
Discount Factor	1.08	1.18	1.28	1.39	1.50	1.63	1.77	1.92	2.08
Discounted FCF	251	220	242	254	246	234	221	208	195
Total discounted cash flows	4,205								
Plus Cash / Less Net debt	(1,681)								
Equity value	2,524								

Source: : Company, MST Access

Our equity valuation for the LCEP in FY26 is \$2,524m.

Leigh Creek Energy Valuation

The LCK valuation is dependent on the LCEP valuation (above) and more importantly how the project is funded.

Capital structure

LCK currently has 712.6 m shares on issue and 76.9m options outstanding (See Appendix 8).

Additionally, LCK completed a \$6.54m capital raise (\$6m post fees) by way of a placement to Energy Exploration Capital Partners (EECP) in January 2021. Under the terms of the placement EECP can choose the timing of the issuance. (See Appendix 7 for more detail on terms of the raise). To date EECP has been issued 35m shares at \$0.14 (\$4.9m) so has \$1.1m of shares from the first placement to be issued.

EECP has granted LCK an unilateral option to place an additional two tranches of shares to EECP for A\$12m. See Appendix 7.

Equity funding required and LCK valuation

LCK is in the very early stages of project execution and thus has a number of milestones to meet before first urea is sold into the market in 2025. Given we have assumed a 70% debt funding of project capex LCK will require additional equity funding between now and a fully commissioned plant.

Options include equity capital raises and /or partnering and a sell down of the project to fund LCK's share of the required equity contribution.

On the basis that LCK funded 100% of the project by itself, we estimate funding required between now and FY26 is ~\$800m.

We forecast funding requirements through to first production in 2025 of:

- fees payable to DL & EC (up to ~A\$45m) for the Feasibility study, FEED and EPCC work and financing arrangement (we estimate these at 1.5% - 2.0% of construction cost of ~ A\$2.25b),
- Stage 1 funding of ~A\$25m,
- Stage 2 LCEP equity requirements of A\$685m,
- and corporate working capital costs of ~ A\$35m – A\$40m. NB: From FY26 onwards we assume the corporate overhead is part of the LCEP project operating costs.

We believe raising ~\$800m of new equity between now and the LCEP commissioning in 2025 may be difficult for LCK to do on its own.

What if LCK sold down a stake in the LCEP

Our view is that it would be more attractive for existing LCK equity holders for LCK to sell down a stake in the LCEP to fund LCK's equity contribution.

In this scenario, depending on the percentage sold down and the price received for the sell down, we can see valuations for LCK above \$1.50 by FY26.

Our base case valuation assumes LCK sells down 40% of the LCEP equity at a 25% discount to our FY26 project equity value to minimise the equity funding required by existing LCK equity holders.

On this basis we value LCK at A\$1.44 in FY26 or A\$0.57 today (discounted back at our assumed cost of equity (Ke) of 20%.

Clearly, the percentage sold down and the discount to valuation achieved has a material impact on our LCK valuation. If we assumed a 40% sell down of the project at a 20% discount our FY26 valuation lifts to A\$1.76 with our spot valuation lifting to A\$0.69.

Figure 22 – MST Forecast LCK Valuation with a 40% sell down of LCEP

A\$m	FY26	Potential shares on issue at 30 Jun 2026 (m)	
Cash flows (Project Value)	4,205	Potential current diluted shares	790
Less project net debt	(1,681)	Equity required \$m	828
Equity value	2,524	Sell % of project	40%
Post sell down LCK share of equity	1,514	Discount to fair value	25%
Option exercise	14	Received for percentage sold (\$m)	757
LCK Valuation	1,529		
Potential shares on issue FY26 (m)	1,062	LCK Equity funding required \$m	71
Equity value per share FY26	\$1.44	Issue Price	\$0.26
Discount back at Ke	20.1%	New shares	273
Discounted back to today	\$0.57	Total shares at FY26	1,062

Source: Company, MST Access

We have run an analysis to demonstrate the forecast the LCK value sensitivity to the percentage of LCEP sold down and the discount to fair value the stake is sold at.

Figure 23 – MST Forecast Spot LCK Valuation at different LCEP % sell down and % sale discount (A\$)

		Percentage sell down				
		25.0%	30.0%	35.0%	40.0%	45.0%
Discount to calculated equity value	20%	0.37	0.43	0.52	0.69	1.15
	25%	0.35	0.39	0.46	0.57	0.79
	30%	0.33	0.36	0.41	0.48	0.60
	35%	0.31	0.34	0.37	0.41	0.49
	40%	0.30	0.31	0.34	0.36	0.41
	45%	0.28	0.29	0.31	0.33	0.35

Source: Company, MST Access

Figure 24 – MST Forecast FY26 LCK Valuation at different LCEP % sell down and % sale discount (A\$)

		Percentage sell down				
		25.0%	30.0%	35.0%	40.0%	45.0%
Discount to calculated equity value	20%	0.94	1.08	1.32	1.76	2.92
	25%	0.89	1.00	1.16	1.44	2.01
	30%	0.84	0.92	1.04	1.22	1.53
	35%	0.80	0.86	0.94	1.05	1.24
	40%	0.76	0.80	0.86	0.93	1.04
	45%	0.72	0.75	0.79	0.83	0.89

Source: Company, MST Access

Global listed comparatives

We have tabled below what we believe are the closest listed comparative companies to LCK:

Figure 25 – Global listed fertiliser producers forecast multiples

Local currency	Ticker	Price	Market Capitalisation	PE (FY1)	PE (FY2)	EV/EBITDA (FY1)	EV/EBITDA (FY2)
ICL Group	ICL-TAE	22.15	28,444	17.4	16.4	8.9	8.4
Incitec Pivot	IPL-ASX	2.27	4,360	15.1	12.5	6.9	6.3
Nutrien	NTR-CAN	73.34	41,790	18.7	17.8	10.7	9.3
Yara	YAR-OSL	444.8	119,265	13.3	13.5	6.8	7.0
Average				16.1	15.1	8.3	7.8

Source: MST Access, FactSet

We note Incitec Pivot, the only locally listed comparative, has a sales mix which is over ~60% from Dyno Nobel, that sells industrial explosives and related products and services to the mining industry.

Environmental, Social and Governance

LCK Creek Energy is committed to conducting its business sustainably and responsibly to create enduring value for all of its stakeholders. It believes that a company's approach to managing Environmental, Social, Governance issues can have a meaningful impact on the company's long-term viability (profits) and success (reputation). It intends to ensure that it has effective management controls for its Environmental, Social and Governance matters across all aspects of its business.

The Company established ESG processes early and will evolve them as it grows

Environmental Approvals

For LCK its petroleum exploration and production activities are governed by the South Australian Petroleum and Geothermal Energy Act 2000 (the PGE Act). The legislation is administered by the Energy and Resources Division of the Department of Energy and Mining (DEM).

In accordance with the PGE Act, LCK prepares Environmental Impact Reports (EIR) and Statement of Environmental Objectives (SEO) for all related activities. The EIR provides stakeholders with the following information:

- a description of the regulated activities to be carried out under the licence;
- a description of the specific site features of the environment that can reasonably be expected to be affected by the activities, with particular reference to the physical and biological aspects of the environment and existing land uses;
- an assessment of the cultural values of Aboriginal and other Australians which could reasonably be foreseen to be affected by the activities in the area of the licence, and the public health and safety risks inherent in those activities (insofar as these matters are relevant in the particular circumstances);
- a description of reasonably foreseeable events associated with the activity that could pose a threat to the relevant environment (including events during the construction, operational and abandonment stages);
- an assessment of the potential consequences and proposed management actions of these events on the environment;
- information on consultation undertaken during the preparation of the EIR.

The SEO outlined the environmental objectives that the regulated activity is required to achieve and the criteria upon which the objectives are to be assessed. The SEO was developed on the basis of information provided in the EIR. Environmental.

As LCK moves into the next phase of the project for future exploration work on the Petroleum Exploration Licence 650 (PEL 650); one EIR and SEO for geophysical operations and one EIR and SEO for exploration drilling operations has been prepared, approved and Gazetted by the South Australian Government during late 2019 and early 2020.

Over and above its legislative requirements LCK has committed to being carbon neutral by 2030, to minimise its footprint by carbon capture and underground storage and to meet a zero emissions (water and chemical) target.

Specific ESG issues

Carbon dioxide production and reduction

Leigh Creek Energy has committed to being carbon neutral by 2030.

Key carbon reduction activities that LCK intend to put in place include:

- Urea Production - 0.73 t of CO₂ are used per tonne of urea produced
- Geo-sequestration - Redundant gasifiers will be used for the capture and storage of CO₂ not used in urea production
- Carbon Farming – LCK will investigate opportunities for farmers to optimise CO₂ stored in soil
- Carbon Offsets – LCK will look to use revegetation and use of renewable power to offset CO₂ emissions

Key differences to the Linc Energy Chinchilla Trial

On 9 April 2018, Linc Energy was found guilty of wilfully and unlawfully causing environmental harm between 2007 and 2013 at Chinchilla, where it had carried out underground coal gasification operations. The court found that Linc Energy never directed staff to follow mandated practices and the outcomes resulted from the company's management failing to follow good industry practice and meet its duty of care obligations.

As part of the review by the South Australia Government into granting approval for LCKs in-situ gasification plant trial the report looked at the key differences between the projects before approving the trial.

https://www.petroleum.sa.gov.au/_data/assets/pdf_file/0004/273073/20180418_-_Summary_of_Leigh_Creek_Energy_Information.pdf

The key differences were tabled in the report and we have reproduced them here:

Figure 26 – Key differences between Linc Energy's Chinchilla trial and the LCEP.

Chinchilla Operations	LCKE Trial
Site operations were commercially driven, operating 5 gasifiers over a period of more than 12 years under a "black box" approach.	LCKE primary focus is environmental performance, demonstrated through a discrete 3 month operation with transparency to the regulator and general public
Regulator considered the operations R&D, had limited engagement with the company and restricted reporting triggers to water bore quality at the boundary of the site.	Regulator is closely engaged with the proponents, has developed a technical understanding of the technology and risks, and has undertaken a rigorous assessment process.
Site characteristics that contributed to environmental risk: 1. Shallow at 125m 2. Permeable coal seam that was a local aquifer 3. Anthropogenic fracture permeability in the coal and immediate roof material 4. CSG bearing coal 5. Nearby water users of the coal seam aquifer	Site characteristics that minimise environmental risk: 1. Deep at 540m (more than 4 times Chinchilla site) 2. Very low permeability of coal (an aquitard) 3. Fractures and fracturing risk deemed low through comprehensive geotechnical investigations 4. Non-gas bearing coal 5. Aquitard has no value for groundwater users
Operational actions that contributed to environmental risk: 1. Operating pressure was neither declared by proponent nor prescribed by regulator 2. Operating pressures exceeded containment pressures 3. Hydraulic fracturing – intentional and unintentional 4. Proponents set well design standards which were largely inadequate 5. Progressive depressurisation of coal seam water levels 6. No monitoring requirements, triggers or actions of the process area	Operational actions that will reduce environmental risk: 1. Operating pressures declared by proponent based on verifiable data 2. Operating pressures automatically set to stay below hydrostatic pressure (key safety feature) 3. Low risk of hydraulic fracturing (known breakover pressure) 4. Well designs aligned to industry standards 5. Depressurisation highly localised due to low permeability 6. Strict monitoring requirements for groundwater, air and soil in process area

Source: Company

Social

LCK is committed to involving stakeholders of the Project in an honest and open two-way communication. This proactive approach will enable LCK to draw on local knowledge held by the Project's stakeholders to identify and address issues of concern or importance, and to optimise the benefits of the Project to the local and regional communities.

It intends to continue its outstanding safety record, maintain positive, enduring stakeholder relationships, develop community education and sponsorship programmes, staff mental health initiatives and develop ethical supply chains.

Sustainability

Every time a crop or animal product is exported from a farm, nutrients, notably nitrogen, phosphorus, potassium and sulphur have been removed from the farm and its soils.

To sustain current and future productivity, the nutrients need to be replaced by applying fertilisers. The most common fertilisers are nitrogen based with granular urea being the most common nitrogen-based fertiliser used in our agricultural systems.

In the last 50 years global crop production has expanded threefold. Without fertilisers to increase farm productivity to feed the world, vast areas of additional land would have needed to be converted from natural eco systems like rain forests into agricultural production.

As populations continue to grow, and with higher yields of food per hectare of land are required and more nutrients must be replaced to maintain sustainable land use.

Governance

LCK is committed to achieving and demonstrating the highest standard of Corporate Governance and is committed to complying with the ASX Corporate Governance Principles and Recommendations (third edition) as appropriate.

The Board guides the affairs of the Company on behalf of the shareholders by whom they are elected and to whom they are accountable. The Board has responsibility for the overall Corporate Governance of the Company including its strategic direction, establishment of goals for its management and monitoring the achievement of these goals.

As part of the commitment LCK has officially qualified as a signatory to the United Nations Global Compact after demonstrating and fulfilling the eligibility criteria for human rights, labour, environment and anti-corruption required for businesses to partake in the world's largest corporate sustainability initiative.

Appendix 1 – Board & Senior Management

Justyn Peters - Executive Chairman

Justyn joined Leigh Creek Energy as Non-Executive Director on 28 November 2014 and was appointed Executive Chairman on 27 May 2015.

Justyn is a qualified Lawyer and has many years' experience in the ISG industry and in senior management positions. He has had over a decade of experience with investing entities based offshore, and in particular in China, investing directly into Australian mining, energy and infrastructure projects and brings with him extensive deal structuring experience and long dated contacts. Justyn's experience includes working in the mining industry, for industry representative bodies and for various state and federal environment departments and authorities.

Phil Staveley – Managing Director

Phil is a qualified Accountant who has 30 years' experience working in the resources sector. He started his career in the oil and gas sector working for Schlumberger in London, followed by a number of years with SAGASCO and SAOG (South Australian Oil and Gas Company). He spent almost ten years with Normandy Mining Ltd. Whilst with Normandy he fulfilled a number of planning, finance, M&A and commercial roles, including the establishment of a Group Supply Function and three years based in Rio de Janeiro as the CFO of TVX Normandy Americas. Since 1998 he has been involved in mining and contracting companies in the position of CFO and more latterly, CEO roles with an emphasis on strategy and corporate finance.

Zheng Xiaojiang - Non-Executive Director

Zheng joined the Leigh Creek Energy Board as Non-Executive Director on 5 December 2017. Zheng is a senior finance executive and brings wide experience in the finance sector in both Australia and China. His experience includes having been a senior official for The People's Bank of China in Australia and New Zealand. Zheng was responsible for facilitating the investment in LCK by China New Energy, LCK's largest shareholder.

Zhe Wang - Non-Executive Director

Zhe joined the Leigh Creek Energy Board as a Non-Executive Director on 1 July 2017. Zhe is a Chinese based Energy and Thermal Physics Engineer, who was appointed to the Board as a nominee of China New Energy Group Limited (one of Leigh Creek Energy's major shareholders). Zhe has over 8 years executive management experience. Zhe also sits on the Board of Beijing Raise Mind Technology Ltd. Zhe's key areas of expertise include Coal Combustion; Renewable Energy Applications and Steel Sinter. He has a Bachelor of Thermo Dynamics, Renewable Energy Applications as well as a Masters in Energy Engineering and Thermal Physics, Coal Combustion.

Murray Chatfield - Non-Executive Independent Director

Murray joined the Leigh Creek Energy Board as a Non-Executive Director in June 2016. Murray brings a wide area of expertise covering the financial sector, entrepreneurial, commodity, technology and service facing sectors that will ensure strategic focus and vision, together with the attention to detail to guide the creation, reorganisation and expansion of the business to achieve sustained benefits. Murray has a diverse skill set covering finance, treasury, accounting, operational efficiency, risk management (business, market, tax and regulatory), legal and regulatory compliance and direct financial market interaction

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

Greg joined the Leigh Creek Energy Board as Non-Executive Director on 22 September 2015. Greg is a qualified Mining Engineer and Lawyer. He is currently a partner of Piper Alderman Lawyers and specialises in mining, commercial and securities law. He is a qualified Mining Engineer, with experience on a wide variety of mining projects for MIM Limited, ETSA, Kalgoorlie Consolidated Gold Mines and Normandy Mining Limited. Greg is currently the Non-Executive Chairman of Archer Exploration Limited and Core Exploration Limited and was a previous Director of ASX listed Gawler Resources Ltd. Greg's experience in the mining industry, particularly in capital raising, tenement acquisition, project management and business development, and his industry knowledge and business relationships, will assist Leigh Creek Energy Limited to manage and develop its existing tenement portfolio and to identify and secure other high quality exploration assets.

Noel Whitcher – Chief Financial Officer

Noel is CA with more than 15 years' experience in financial management across the resources sector, along with State & local Government departments. He began his career as a graduate with PIRSA, before moving to the UK to take up a position managing the finances of a social housing company. Since returning to Australia, Noel has worked predominantly in the Industrial Minerals Industry in a business partnering role across South Australia and Western Australia for Sibelco Australia Limited. Prior to his current role Noel was head of Finance Manager for NAWMA, a waste management and resource recovery company operating in northern Adelaide. In this role he had overall responsibility for all corporate and client facing functions of the business. Noel became a full member of CPA Australia in 2009 and has since been accepted as a member of the Chartered Accountant Australia and New Zealand (CAANZ).

Jordan Mehrtens – Company Secretary

Jordan is a qualified lawyer and has a Bachelor of Commerce (Finance) and a Graduate Diploma in Urban and Regional Planning. Jordan has worked with the Leigh Creek Energy Project since its commencement, providing regulatory, compliance and other analytical advice. Jordan is a member of the Governance Institute of Australia and Australian Mining and Petroleum Law Association. Jordan currently performs the legal role in the Company as well as the formal Company Secretarial duties.

Cristian Bolda – General Manager, Operations

Cristian is an Executive General Manager with 18 years' experience in the resources, energy and power sectors. He has successfully led business lines and cross-functional teams across multiple geographic locations both in Australia and internationally. Cristian during his career has worked with Chevron, Origin, ConocoPhillips, Petrofac, ZADCO, Exxon, Abu Dhabi National Oil Company (ADNOC), OMV Petrom, Rompetrol, KazMunayGas and Ramboll. Cristian has a proven track record for driving operational and project excellence and generating business growth. As an Executive General Manager, Cristian has extensive experience in engineering and construction, strategy development and implementation, contract negotiation and execution along with client and stakeholder management and safely operating the assets. He was involved along his career in Oil and Gas, Coal Seam Gas; Pipeline, Compression, Water Treatment, Power plants, HV Power Transmission & Distribution, airports and infrastructure.

Noreen Byrne – General Manager, People & Sustainability

Noreen is a Senior Manager with over 20 years' experience across several industries including mining, defence, health, media and IT. Prior to moving into the field of People Resources, Noreen started her career as a Geologist in exploration and underground mining in the goldfields. Noreen worked across established organizations and entrepreneurial ventures advising them through the stages of creation, growth, and stabilization. Her breadth of experience across diverse industry groups has provided an exceptional platform to link people and sustainability strategies to business success. As LCK GM People & Sustainability, Noreen is leading LCK's transformation ESG program through developing effective leadership, differentiated talent models, sustainable business models, cultural engagement, environmental excellence and strong governance.

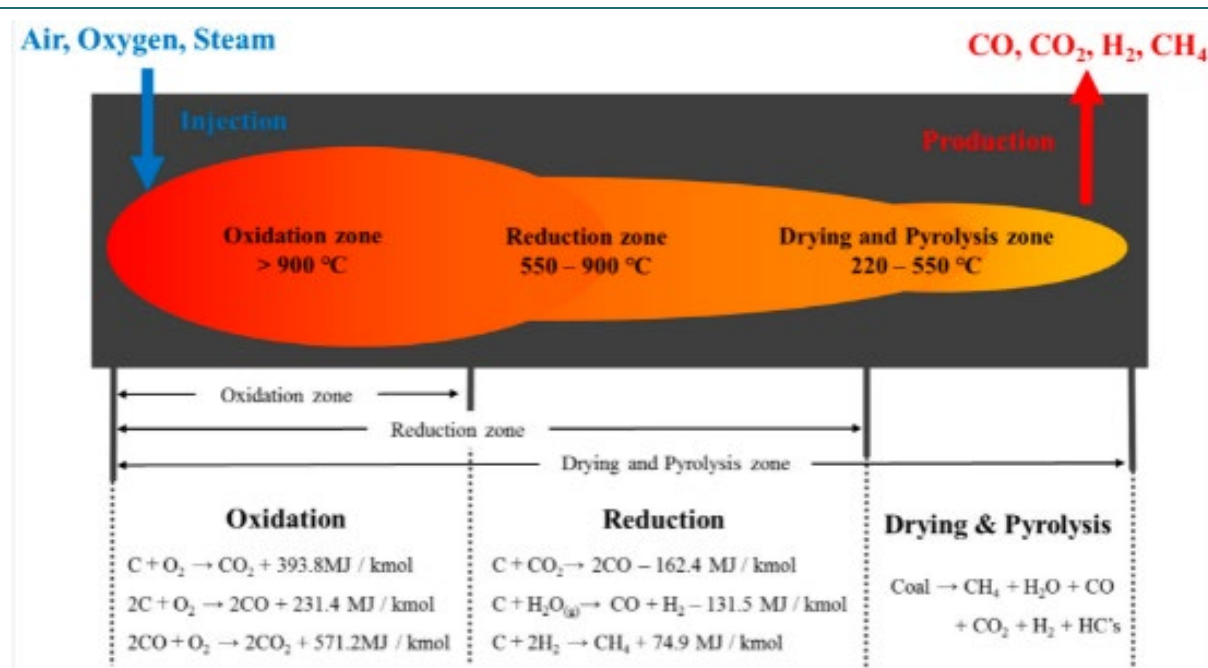
Appendix 2 – Register and Board holdings

Shareholders (ex Board)	Shares ('000)	Percentage of Ordinary Shares
China New Energy Group	136,333	19.1%
Crown Ascent Development	29,501	4.1%
Energy Exploration Capital Partners		0.0%
Directors		
Justyn Peters	7,532	1.1%
Phillip Staveley	1,483	0.2%
Murray Chatfield	1,662	0.2%
		0.0%
Sub total	176,511	24.8%
Other	536,052	75.2%
Total Shares Issued	712,564	100.0%

Source: FactSet, MST Access

Appendix 3 – Chemical reactions in ISG process

Figure 27 – Chemical reactions in ISG of coal

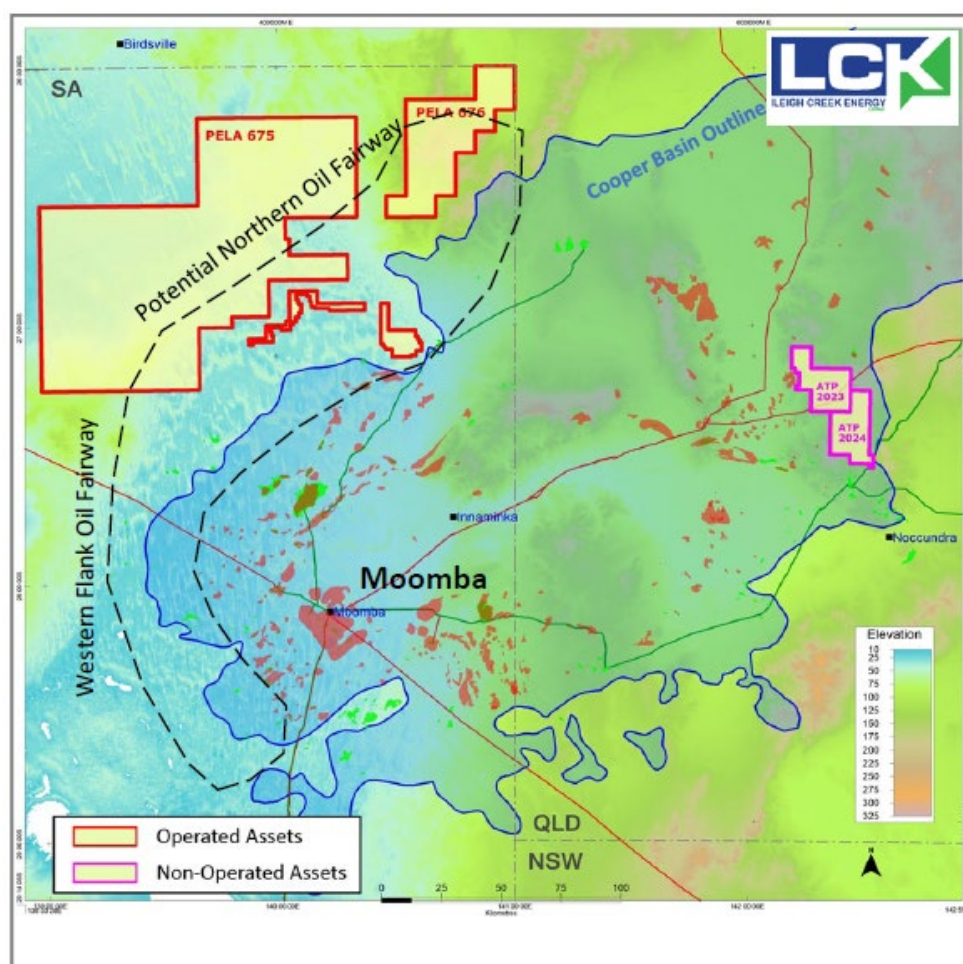


Source: Company

Appendix 4 – LCK’s other conventional oil & gas activities

In addition to the LCEP, LCK has diversified its portfolio into other oil & gas activities, focussing on operations in the Cooper Basin. The Cooper Basin was selected as it provides it with a low cost of entry, relatively low risk, potential for near-term revenue as well as a favourable and stable regulator in the South Australian and Queensland governments. LCK’s initial activity was to execute a Farm-in Agreement with Bridgeport Energy (QLD) Pty Limited as operator of ATP 2023 and ATP 2024. These permits are 10km north of the Jackson Field, Australia’s largest onshore oil field and are largely under-explored, providing opportunities for multiple conventional oil and gas plays. They are located close to infrastructure, minimising potential future tie-in and operational costs. It is expected that the 3D seismic surveys to be acquired in Permit Year 2 will mature the currently identified prospects and lead to drillable targets. Following on from this, LCK were successful in bidding for two Petroleum Exploration Licence Applications (PELAs) in the recent South Australian Cooper Basin Acreage Release.

Figure 28 – LCK’s other conventional oil & gas licenses



Source: Company

PELA 675 and PELA 676 are both proximal to historic hydrocarbon discoveries. They contain 2D seismic and the 3D seismic in the southern part of PELA 676 has been used to identify leads in the potential Northern Oil Fairway.

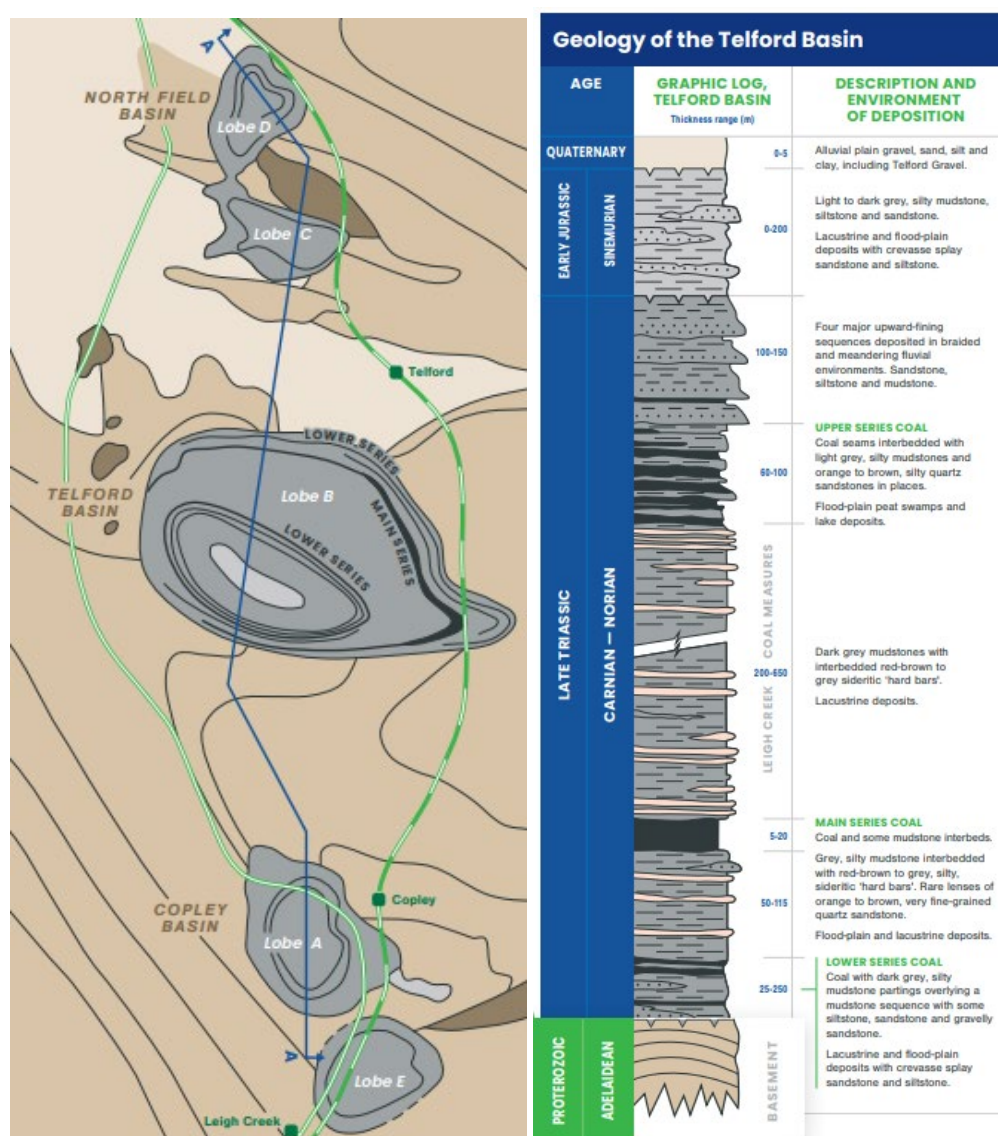
The next stage is to enter into Native Title agreements prior to being awarded the Petroleum Exploration Licences (PELs). LCK will look to farm down a portion of the SA permits once it has identified drillable prospects.

Appendix 5 – Geology of the Telford Basin where Leigh Creek is located

Leigh Creek Energy's in situ gasification (ISG) demonstration project sits within the Telford Basin of the Leigh Creek Coalfield. The Leigh Creek area is home to five coal bearing basins, with the Telford Basin also being referred to as Lobe B. The Telford Basin's geology is unique to the area and has played a major role in shaping the history of South Australia and the townships of Leigh Creek and Copley. The Telford Basin is the largest of the five basins in the Leigh Creek area with each of the five basins sitting (like bowls) within the 540+m year-old Adelaidean basement rocks. The Telford Basin is an asymmetrical, ellipse shaped basin approximately 8km by 5km and reaches depths of up to 1,000m. The Leigh Creek Coal Measures occur in three main sequences, named in descending order as the Upper Series Coal, Main Series Coal and Lower Series Coal.

The upper series coal comprises approximately 100m of interbedded mudstone, siltstone and numerous coal layers with minor fine grained sandstone. The main series coal comprises a 20m thick zone of coal and some interbedded mudstone. The lower series coal contains two coal layers with dark grey, silty mudstone in a zone approximately 60m thick.

Figure 29 – Geology of the Leigh Creek Coalfield



Source: Company

Appendix 6 – Resource and reserve definition

Estimated quantities of potentially recoverable petroleum can be placed into three categories. In order of increasing certainty, they are Prospective Resources, Contingent Resources and Reserves.

Prospective Resources are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future projects.

Contingent Resources are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations but where the applied project(s) are not yet considered mature enough for commercial development due to one or more contingencies.

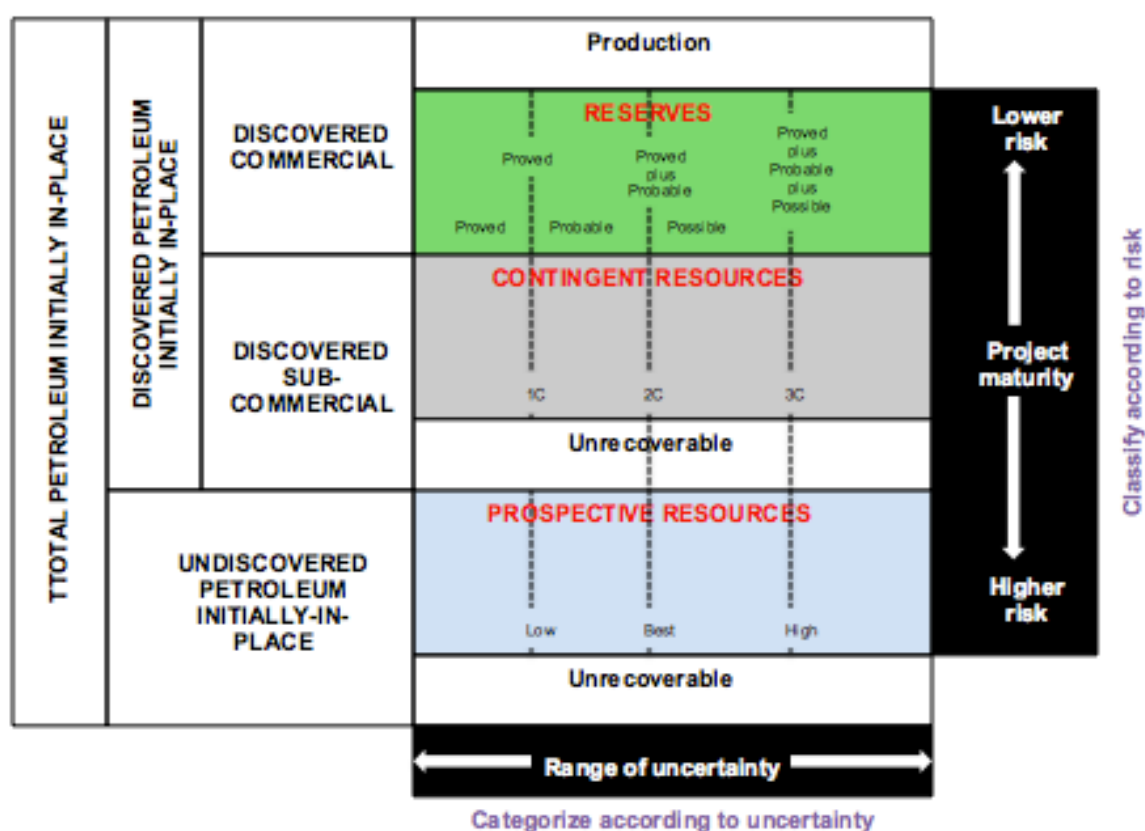
Reserves are those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations. The categories within Reserves, in decreasing certainty, are Proved, Probable and Possible.

Proven reserves (1P) - Quantities of petroleum that can be estimated with reasonable certainty (at least 90 per cent) to be commercially recoverable. Also known as 1P or P90 reserves.

Proven and probable reserves (2P) - Proven reserves plus reserves that are deemed probable (at least 50 per cent likely) to be commercially recoverable. Also known as 2P or P50 reserves.

Proven, probable and possible reserves (3P) - Proven and probable reserves plus reserves that are deemed possible (at least 10 per cent likely) to be commercially recoverable. Also known as 3P or P10 reserves.

Figure 30 – Classification of Petroleum Reserves and Resources



Source: Society of Petroleum Engineers

Appendix 7 – Energy Exploration Capital Partners (EECP) Equity terms

LCK will issue placement shares in relation to all or part of each of the second and third investments on the EECP's request, within 24 months of the date of the corresponding investment. The number of shares issued by LCK will be determined by applying the Purchase Price (as set out below) to the subscription amount prepaid by the Investor.

The Purchase Price will be the average of the five daily volume-weighted average prices selected by EECP during the 20 consecutive trading days immediately prior to the date of EECP's notice to issue shares, less a 10% discount (or a 13% discount if the Placement Shares are issued after 4 January 2022) (rounded down to the next one tenth of a cent, or if the share price exceeds \$0.20, the next half a cent).

The purchase price will not be the subject of a cap. LCK has put strict protections in place regarding EECP's activities, such as trading restrictions and anti-shortening provisions. In addition, EECP is incentivised to see LCK's share price grow through being an option holder (with the options being issued at a substantial premium (see below)).

LCK will have the right to refuse an issuance of shares in relation to EECP's request for issuance and instead to repay the subscription amount by making a payment to EECP equal to the number of shares that would have otherwise been issued by the greater of the purchase price and the market value of the placement shares at that time. Notwithstanding LCK's exercise of its option to receive the Second Investment and/or the Third Investment, EECP will not be obligated to provide the additional funding if the market price of LCK's shares is below \$0.085 (in relation to the Second Investment) or \$0.14 (in relation to the Third Investment) and does not recover to above that level within two months after the Investor providing LCK with notice thereof.

LCK made an initial issuance of 6.75m placement shares to EECP at the time of the funding of the first placement, towards the ultimate number of placement shares to be issued. Alternatively, in lieu of applying these shares towards the aggregate number of the placement shares to be issued by LCK, EECP may make a further payment to LCK equal to the value of these shares determined using the purchase price at the time of the payment.

If LCK proceeds with the Second Investment and the Third Investment, net proceeds from the Second Investment and the Third Investment will not exceed 8% of LCK's market capitalisation (each), without EECP's consent.

Neither EECP nor LCK has any obligation in relation to the Second Investment or the Third Investment unless LCK exercises its option to put these investments to EECP.

In order to exercise its option in relation to each of the Second Investment and the Third Investment, LCK must have sufficient placement capacity to receive the investment at the time it exercises its option to receive the investment, obligating EECP to provide the funding relating to that investment. LCK will determine whether to exercise the option in relation to the Second Investment or the Third Investment, or both, prior to the deadline for its exercise, in its sole discretion.

LCK has agreed to issue 4,029,851 shares in satisfaction of a fee payable to the Investor and to grant 9.8 million options exercisable at \$0.236 (representing a 140% premium over the prevailing market price) to the Investor.

Appendix 8 – Capital structure and outstanding options

Figure 31 – Leigh Creek Energy Capital Structure

	Options in the money	Total (m)	Exercise Price	Cash raised (A\$m)	Exercisable from	Exercise Date
Current Shares on issue (m)	712.6	712.6				
Plan 11	0.0	0.8	\$0.30	0.0	20-Jul-16	8-May-21
Plan 5	0.0	2.0	\$0.35	0.0	10-Oct-16	10-Oct-21
Plan 5	0.0	2.0	\$0.45	0.0	10-Oct-16	10-Oct-21
Plan 9	5.0	5.0	\$0.25	1.3	18-Jul-18	16-Jul-22
Plan 16	0.8	0.8	\$0.25	0.2	18-Jul-18	16-Jul-22
Plan 8	5.0	5.0	\$0.25	1.2	18-Jan-19	3-Jul-22
Plan 7	0.0	5.0	\$0.35	0.0	18-Jan-19	17-Apr-23
Plan 12	1.5	1.5	\$0.20	0.3	1-Mar-19	31-Oct-21
Plan 12	1.5	1.5	\$0.22	0.3	1-Mar-19	31-Oct-21
Plan 12	1.5	1.5	\$0.24	0.4	1-Mar-19	31-Oct-21
Plan 12	0.0	1.5	\$0.26	0.0	1-Mar-19	31-Oct-21
Plan 10	8.4	8.4	\$0.23	1.9	13-Dec-19	12-Dec-23
Plan 15	5.5	5.5	\$0.18	1.0	17-Mar-20	16-Mar-23
Plan 14	5.5	5.5	\$0.14	0.7	17-Mar-20	16-Mar-23
Plan 23	12.2	12.2	\$0.00	0.0	30-Jun-20	29-Jun-24
Plan 21	7.2	7.2	\$0.12	0.9	19-Aug-20	18-Aug-24
Plan 22	1.9	1.9	\$0.00	0.0	4-Nov-20	15-Apr-25
Energy Exploration Capital Partners	9.8	9.8	\$0.24	2.3		13-Jan-24
Options (m)	65.7	77.0		10.5		
Potential diluted shares on issue (m)	778	790				

Source: Company

Disclaimers

MST Access is a registered business name of MST Financial Services Pty Ltd (ACN 617 475 180 "MST Financial") which is a limited liability company incorporated in Australia on 10 April 2017 and holds an Australian Financial Services Licence (Number: 500 557). This research is issued in Australia through MST Access which is the research division of MST Financial. The research and any access to it, is intended only for "wholesale clients" within the meaning of the Corporations Act 2001 of Australia. Any advice given by MST Access is general advice only and does not take into account your personal circumstances, needs or objectives. You should, before acting on this advice, consider the appropriateness of the advice, having regard to your objectives, financial situation and needs. If our advice relates to the acquisition, or possible acquisition, of a particular financial product you should read any relevant Product Disclosure Statement or like instrument.

This report has been commissioned by Leigh Creek Energy Limited and prepared and issued by David Fraser of MST Access in consideration of a fee payable by Leigh Creek Energy Limited. MST Access receives fees from the company referred to in this document, for research services and other financial services or advice we may provide to that company. The analyst has received assistance from the company in preparing this document. The company has provided the analyst with communication with senior management and information on the company and industry. As part of due diligence, the analyst has independently and critically reviewed the assistance and information provided by the company to form the opinions expressed in the report. Diligent care has been taken by the analyst to maintain an honest and fair objectivity in writing this report and making the recommendation. Where MST Access has been commissioned to prepare Content and receives fees for its preparation, please note that NO part of the fee, compensation or employee remuneration paid will either directly or indirectly impact the Content provided.

Accuracy of content: All information used in the publication of this report has been compiled from publicly available sources that are believed to be reliable, however we do not guarantee the accuracy or completeness of this report and have not sought for this information to be independently verified. Opinions contained in this report represent those of MST Access at the time of publication. Forward-looking information or statements in this report contain information that is based on assumptions, forecasts of future results, estimates of amounts not yet determinable, and therefore involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of their subject matter to be materially different from current expectations.

Exclusion of Liability: To the fullest extent allowed by law, MST Access shall not be liable for any direct, indirect or consequential losses, loss of profits, damages, costs or expenses incurred or suffered by you arising out of or in connection with the access to, use of or reliance on any information contained on this note. No guarantees or warranties regarding accuracy, completeness or fitness for purpose are provided by MST Access, and under no circumstances will any of MST Financial's officers, representatives, associates or agents be liable for any loss or damage, whether direct, incidental or consequential, caused by reliance on or use of the content

General Advice Warning

MST Access Research may not be construed as personal advice or recommendation. MST encourages investors to seek independent financial advice regarding the suitability of investments for their individual circumstances and recommends that investments be independently evaluated. Investments involve risks and the value of any investment or income may go down as well as up. Investors may not get back the full amount invested. Past performance is not indicative of future performance. Estimates of future performance are based on assumptions that may not be realised. If provided, and unless otherwise stated, the closing price provided is that of the primary exchange for the issuer's securities or investments. The information contained within MST Access Research is published solely for information purposes and is not a solicitation or offer to buy or sell any financial instrument or participate in any trading or investment strategy. Analysis contained within MST Access Research publications is based upon publicly available information and may include numerous assumptions. Investors should be aware that different assumptions can and do result in materially different results.

MST Access Research is distributed only as may be permitted by law. It is not intended for distribution or use by any person or entity located in a jurisdiction where distribution, publication, availability or use would be prohibited. MST makes no claim that MST Access Research content may be lawfully viewed or accessed outside of Australia. Access to MST Access Research content may not be legal for certain persons and in certain jurisdictions. If you access this service or content from outside of Australia, you are responsible for compliance with the laws of your jurisdiction and/or the jurisdiction of the third party receiving such content. MST Access Research is provided to our clients through our proprietary research portal and distributed electronically by MST to its MST Access clients. Some MST Access Research products may also be made available to its clients via third party vendors or distributed through alternative electronic means as a convenience. Such alternative distribution methods are at MST's discretion.

Access and Use

Any access to or use of MST Access Research is subject to the Terms and Conditions of MST Access Research. By accessing or using MST Access Research you hereby agree to be bound by our Terms and Conditions and hereby consent to MST collecting and using your personal data (including cookies) in accordance with our Privacy Policy (<https://mstfinancial.com.au/privacy-policy/>), including for the purpose of a) setting your preferences and b) collecting readership data so we may deliver an improved and personalised service to you. If you do not agree to our Terms and Conditions and/or if you do not wish to consent to MST's use of your personal data, please do not access this service.

Copyright of the information contained within MST Access Research (including trademarks and service marks) are the property of their respective owners. MST Access Research, or any portion thereof, may not be reprinted, sold or redistributed without the prior and written consent of MST