

Wednesday, 27 March 2019: ASX ANNOUNCEMENT (ASX: LCK)

## Leigh Creek Energy Project Resource Upgraded to East Coast Markets Largest Uncontracted 2P Gas Reserve

- 1,153 PJ (1.1 Tcf) 2P reserve certified by independent PRMS consulting engineer
- LCEP now Australia’s largest uncontracted 2P gas reserve serving the East Coast market
- Potential for future additional reserve upgrades

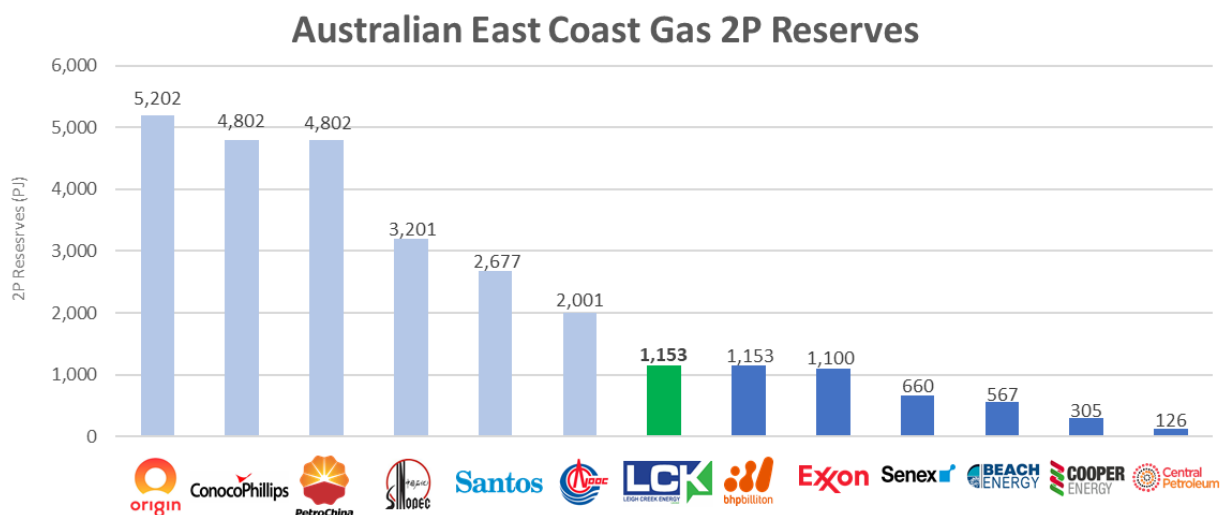
Leigh Creek Energy Limited (ASX: LCK) (“LCK” or “Company”) is pleased to announce that it has received a PRMS certification of 1,153 PJ 2P at the Leigh Creek Energy Project (LCEP) from MHA Petroleum Consultants, based in Denver, USA (report attached).

RESERVES (PJ)	
<u>2P</u>	<u>3P</u>
1,153.2	1,608.3

RESOURCES (PJ)	
<u>2C</u>	<u>3C</u>
1,469.0	2,126.6

This classification is 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. This 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 unequivocally represents one of Eastern Australia’s largest undeveloped and uncontracted gas reserves. (based on the Australian Energy Regulator report 2018)



Source: Australian Energy Regulator 2018

NB: Light blue colour denotes that gas reserves for Origin Energy, ConocoPhillips, PetroChina, Sinopec, SANTOS and CNOCC are contracted to LNG export projects

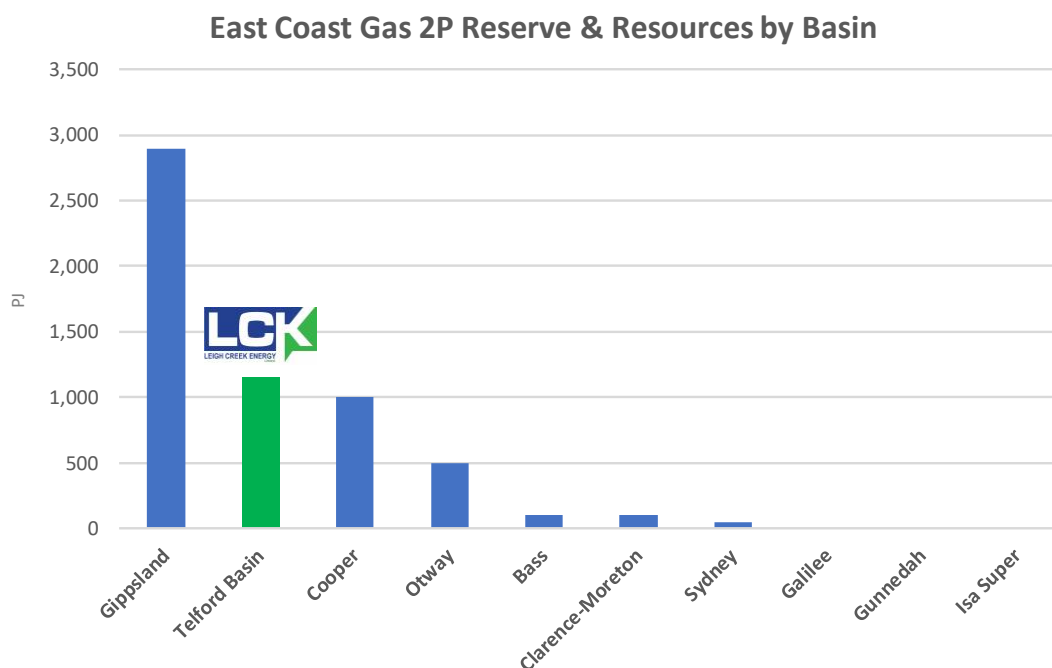
This is an historic milestone for the Company, its stakeholders, and the Australian gas market. Eastern Australian gas consumers are currently facing an energy crisis, where East Coast gas reserves were recently noted to no longer be able to satisfy demand beginning as early as 2022. (Source: *The Australian Financial Review* 21 February 2019 and 27 February 2019)

Justyn Peters, Executive Chairman of Leigh Creek Energy Ltd stated:

*“This independent confirmation and certification of such a large 2P energy reserve means that LCK can further advance with its negotiations with potential joint-venture partners on investment structures and the full-funding solutions for a commercial facility at the Leigh Creek Energy Project. Full-scale operations at the Leigh Creek Energy Project presents a fantastic economic opportunity for the Company and considerable value for shareholders. We look forward to being able to update the market on our continued progress.”*

### Independent PRMS Assessment of 1,153 PJ (1.1 Tcf) of 2P Gas Reserves

LCK’s 2P resource of 1,153 PJ (1.1 Tcf) gas reserves are located entirely in 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<sup>(1)</sup>, LCK’s reserves within the LCEP are approximately the same size, on a 2P reserve basis, as the entire Cooper Basin. Furthermore, the Company holds a larger 2P reserve than the Otway, Bass, Gunnedah, Clarence-Moreton, Sydney and Galilee Basins COMBINED.



Quantity of reserves (PJ) and resources (PJ) in the East Coast Gas Market as of June 2018. Excludes Surat and Bowen Basins.

Source: <sup>(1)</sup> Australian Consumer and Competition Commission - Gas inquiry, 2017–2020, Interim report, December 2018 (data obtained from gas producers)

LCK’s 2P reserves of 1,153 PJ (1.1 Tcf) are contained entirely within Petroleum Exploration License 650 of the Telford Basin. LCK’s PCD demonstrated commercial gas production from only one of the three coal seams located within the licence.

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,

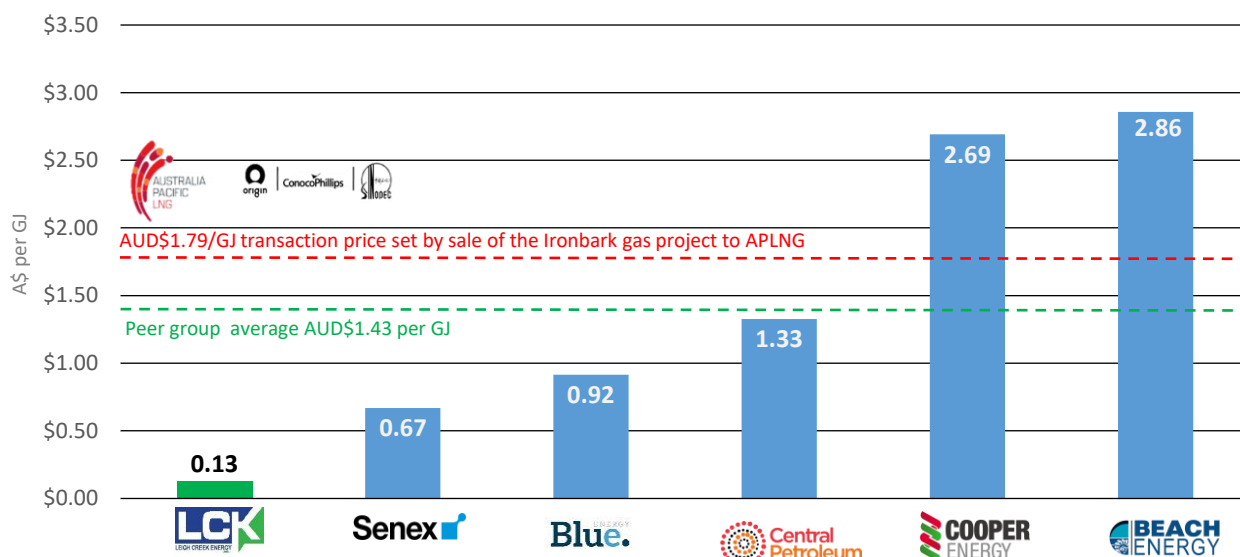
there is additional opportunity for future reserve upgrades of the 2C contingent resource figures to capture the resources contained in the upper series and lower series coal seams.

## LCK Gas Reserves

On February 20<sup>th</sup>, 2019 Origin Energy Ltd announced the sale of the Ironbark gas project in Queensland to Australia Pacific LNG (AP LNG) for A\$231 million (US\$164.43 million) or A\$1.79 per GJ. The Ironbark Project (Ironbark) contains 129 PJ (proven and probable) of coal seam gas resources. (Source: Australian Financial Review 20<sup>th</sup> February 2019).

This transaction sets a new benchmark price for gas transactions that are currently uncontracted and still in development. LCK has nearly 10x the amount of 2P gas reserves as Ironbark. While there are multiple financial data points to consider in any transaction, based on the transaction metric of acquisition price to 2P reserves alone this would potentially provide LCK with an implied valuation that exceeds A\$2 billion.

## Enterprise Value per 2P Reserve (AUD\$/GJ)



## Path Forward

LCK has multiple commercialisation paths for an asset of this size and quality, mainly the (1) sale of synthetic **natural gas** into the Australian East Coast market and/or (2) using the gas to manufacture **ammonia-based fertiliser products**, both of which have significantly positive economic returns.

LCK has capacity to enter both markets simultaneously, therefore, a third option exists in which a combination of the two previously-mentioned options are utilised. LCK is actively in discussions with both financial and strategic partners to execute these strategies.

Phil Staveley, Managing Director of Leigh Creek Energy Ltd, stated:

*“This certification cements LCK’s project status firmly in the gas market in Australia. The Company is working through negotiations with over a dozen gas purchasers who are seeking a material amount of gas supply, while we progress the dual path and scoping aspects of a compelling fertiliser strategy.”*

*“We would like to thank MHR Petroleum Consultants (Denver) and our team for their work on the PRMS. We are very pleased at the recent progress and look forward to progressing to the next stage of development.”*

**For further information, contact:**

Tony Lawry | Investor Relations

T: +61 412 467 160 | E: [tony.lawry@lcke.com.au](mailto:tony.lawry@lcke.com.au)

Ben Jones | Media and Communications

T: +61 419 292 672 | E: [ben.jones@lcke.com.au](mailto:ben.jones@lcke.com.au)

**Resource Compliance Statement**

*The PRMS resources estimates stated herein are based on, and fairly represent, information and supporting documentation prepared by Timothy Hower of MHA Petroleum Consulting, Denver USA. Mr Hower is a member of the Society of Petroleum Engineers and has consented to the use of the Resource estimates and supporting information contained herein in the form and context in which it appears. A copy of the report by Mr Hower is attached to this announcement.*

*LCK also announces that it has an updated JORC Resource Estimation of the coal tonnes within the Telford Basin, based upon the latest information and data available. The updated Geological Model and JORC Resource Estimation report, prepared by Warwick Smyth & Lynne Banwell of GeoConsult Pty Ltd during March 2019 was used in this latest PRMS estimation. A copy of the GeoConsult report on the updated Geological Model and JORC Resource Estimation is available to view at [www.lcke.com.au](http://www.lcke.com.au).*

<b>Requirements Applicable to Reporting Petroleum Reserves for Material Oil and Gas Projects - ASX Listing Rule 5.31</b>	
<b>RESERVES AND RESOURCES DETAILS</b>	
Economic assumptions and methodology used to calculate the estimates of petroleum reserves	See attached MHA report
Does the entity have operator interests in the project	LCKE is the operator of the project
Types of Permits or Licences held by the entity in respect of the reported estimates of petroleum reserves	Petroleum reserves and resources are within PEL 650.
Basis for confirming commercial producibility and booking petroleum reserves	See attached MHA report
The analytical procedures used to estimate the petroleum reserves	See attached MHA report
The proposed extraction method and any specialised processing required following extraction	Underground Coal Gasification. No specialised processing is required following extraction.
Estimated quantities to be recovered	See attached MHA report
<p><u>Undeveloped Reserve:</u> Status of the project</p> <p>Development date</p> <p>Marketing arrangements and access to transport</p> <p>Environmental approvals required</p>	<p>The PCD (Pre Commercial Demonstration) gasifier will be shut down in the near future. The project will target the existing reserves and resource using future underground gasifiers.</p> <p>Development is anticipated to reach commercial production in 2024.</p> <p>The petroleum resources and reserves were estimated based on a commercial study for a power station exporting power through the existing electricity infrastructure. See the ASX announcement above for future potential options.</p> <p>Environmental approvals are required for the construction and operation of the future underground gasifiers.</p>
If the reported estimates of petroleum reserves relate to unconventional petroleum resources, the land area and number of wells for which the estimates of petroleum reserves are provided.	See attached MHA report.
If 1P is zero for the reported estimates of petroleum reserves, a brief explanation of why 1P is zero and why, in the absence of 1P, 3P and 2P have been determined and reported.	See attached MHA report.

25<sup>th</sup> March 2019

Mr. John Centofanti  
Leigh Creek Energy Limited  
PO Box 12  
Rundle Mall  
Adelaide, South Australia 5000



**Re: Updated PRMS ISG Gas Reserves and Resources Certification  
PEL 650; Leigh Creek Energy Project**

Dear John:

At the request of Leigh Creek Energy Limited ("LCK"), MHA Petroleum Consultants LLC ("MHA") have prepared an updated estimate of the gas reserves and resources associated with In-Situ Gasification ("ISG") of the coal volumes located in PEL 650, the Leigh Creek Energy Project ("LCEP"). The estimates of Contingent Resources in this report have been prepared in accordance with the definitions and guidelines set forth in the June 2018 Petroleum Resources Management System ("PRMS"), as well as the 2011 Guidelines for Application of the PRMS, approved by the Society of Petroleum Engineers.

Based on our evaluation, MHA estimates the gas reserves and resources associated with the LCEP and attributable to the gross (100% ownership) interest in the property, effective 25<sup>th</sup> March 2019, to be:

Area	Category	Estimated Recoverable Energy (PJ)
PEL 650; LCEP	1P Reserves	0.0
PEL 650; LCEP	2P Reserves	1,153.2
PEL 650; LCEP	3P Reserves	1,608.3
PEL 650; LCEP	1C Contingent Resources	0.0
PEL 650; LCEP	2C Contingent Resources	1,469.0
PEL 650; LCEP	3C Contingent Resources	2,126.6

Notes to the above table:

- 1P Reserves = Proved
- 2P Reserves = Proved + Probable
- 3P Reserves = Proved + Probable + Possible
- 1C Contingent Resources = Low Estimate
- 2C Contingent Resources = Best Estimate
- 3C Contingent Resources = High Estimate

The LCEP is located 240km north-northeast of the township of Port Augusta in South Australia within PEL 650. Petroleum Exploration License 650 covers 93.4km<sup>2</sup>. The holder of the license is ARP TriEnergy Pty Ltd, which is 100% owned by LCK. The license expiry is 17 November 2019. LCK has the rights to a Petroleum Production License under which ISG extraction is entitled.

Conventional open cut coal mining of the project area by Alinta Energy concluded in November 2015. A mine data set was provided by Alinta Energy to LCK for the project area. The data comprised previous deposit technical reports, information for 6084 drillholes, 65 drillholes with Log ASCII Standard (“LAS”) files, 211 drillholes with hardcopy wireline geophysics, 3189 drillholes with coal quality analysis, 4 2D seismic lines, as well as a mine survey. Additional information on the project area was sourced from GSA Coal Geology publications and conference proceedings.

MHA was provided with a Geological and Modelling Report prepared in March 2019 by GeoConsult Pty Ltd. This report included an estimate of the Indicated and Inferred Coal Resource associated with the project area and reported in accordance with the JORC code, 2012 edition. The GeoConsult geological model was based upon 1657 drillholes in the upper series coal seams, and 4427 drillholes in the main and lower series coal seams. Re-interpretation of the available seismic data was completed to provide top of coal, fault control and supported coal seam continuity across the project area. MHA conducted a detailed review of the GeoConsult coal resource estimate, and these coal volumes were used in the MHA gas reserves and resources estimate.

In addition to the above referenced GeoConsult report, MHA was also provided with the following supporting documentation:

- Raw data collected from the Leigh Creek Pre-Commercial Demonstration (PCD) gasification site.
- “Leigh Creek Energy Pre-Commercial Plant Syngas Calculation”, report prepared by Prudentia Process Consulting, February 2019.
- “Commercial Significance of Syngas Production by Leigh Creek Energy in their ISG Pre-Commercial Demonstration (PCD) between 25<sup>th</sup> December 2018 and 29<sup>th</sup> January 2019”, report prepared by Zamco Energy Pty Ltd, February 2019.
- “LCKE Lateral Gasifier Drilling Risk”, memo prepared by inGauge Energy Pty Ltd, February 2019.
- A commercial study and financial model for a 40MW power station project fueled by syngas from the LCEP.

MHA conducted a detailed review of all of the referenced reports. The energy values estimated from the results of the PCD were used by MHA in our gas reserves and resources estimate.

The Reserves and Contingent Resources estimated by MHA utilize a deterministic estimation method. It is the opinion of MHA that there are no 1P Proved Reserves associated with the project at the current time. The conversion of coal to synthetic gas, also known as “syngas”, is a commercially viable technology that has been successfully applied in analogous coal deposits elsewhere in the world.

The Reserves and Contingent Resources estimated by MHA were based upon the following approach and calculation methodology:

- A minimum coal seam thickness of 2m
- A maximum coal:dirt ratio of 50%
- Maximum working section raw ash of 50%
- Minimum overburden thickness of 200m
- Standoff from the current highwalls of 100m



- The energy yield of the coal was estimated to be 15.5 GJ/tonne
- A process recovery efficiency, which quantifies the percent of coal in place that is gasified during the ISG process, was estimated at 80%
- 2P reserves volumes were only assigned to areas of Indicated coal resource volumes within the Q-seam
- 3P reserves were only assigned to 50% of the Inferred coal resources volumes within the Q-seam
- 2C and 3C contingent resources were assigned to 50% of the inferred coal resource volumes within the Q-seam, as well all coal resources within all other seams

The reserves estimated in this report satisfy the requirements that a high degree of confidence exists in the commercial producibility of the syngas from the coal volumes for the 2P and 3P reserves cases. Reserves have only been assigned in connection with those estimates of commercially recoverable quantities of syngas. The reserves have been classified as 1P, 2P and 3P, using an arithmetic summation by category. As stated, MHA is of the opinion that there are no 1P reserves associated with the project at the current time. This is because MHA did not feel that PCD data were sufficiently robust to justify a commercial outcome for the 1P case. A more extended and stable gasification trial would be required to achieve this objective. 2P and 3P reserves volumes were assigned in this evaluation, with the difference between the two being drillhole data control and proximity to the PCD.

The contingent resources estimated in this report were aggregated using an arithmetic summation. Contingent resources were applied to all upper coal seams, because the gasification PCD involved the main/lower coal seams. Proximity to the PCD site was also a factor in the determination of whether the contingent resources were classified as 1C, 2C or 3C. No 1C contingent resources were classified in accordance with the guidelines presented in the PRMS regarding “split classification”. The primary contingency associated with preventing these contingent resources syngas volumes being classified as reserves is the lack of a PCD in the upper coal seams. Once that has been demonstrated, then an updated determination can be made at that time. The estimated contingent resources cover an area of 93.4 sq. km across PEL 650.

All reserves and resources volumes estimated in this report assume 100% ownership by LCK and are estimated at the outlet of the syngas plant net of any fuel usage or requirements. MHA has incorporated an 80% process recovery efficiency which will account for any losses or inefficiencies in the gasification process.

This report represents an update to the opinion provided by MHA in our 8<sup>th</sup> January 2016 Resource Certification report for the LCEP. The new information which allowed MHA to update the estimates and to include classification of reserves volumes included:

- The results from the PCD conducted between 25<sup>th</sup> December 2018 and 29<sup>th</sup> January 2019, which confirmed prior laboratory studies and estimates of the process energy yield.
- The updated Geological and Modelling report prepared by GeoConsult which contained a new geostatistical study which substantially increased the amount of Indicated coal resources.
- 24 new drillholes from 2018 that were drilled and added to the database to provide additional information in the main coal seams.



This reserves and resources evaluation was prepared under my direct control and supervision in accordance with the Society of Petroleum Engineers PRMS guidelines. I am the Chief Executive Officer, and a full-time employee, of MHA. I am a Licensed Professional Engineer in the State of Colorado, USA, and an active member of the Society of Petroleum Engineers. I am a qualified petroleum reserves and resources evaluator as defined under the ASX Listing Rule 5.42.

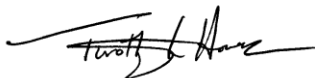
MHA is a leading independent petroleum engineering and certification firm based in Denver, Colorado which has experience working in most of the significant petroleum provinces throughout the world. MHA has completed reserve and resource assessments for a number of clients in Australia and internationally including Adelaide Energy, Arrow Energy, Bow Energy, ConocoPhillips, CS Energy, Eastern Star Gas, Metgasco Ltd, Molopo Energy Australia, Pure Energy, Santos Ltd, Senex, Sunbird Energy and Sunshine Gas.

MHA did not perform any field inspection of the properties. MHA did not investigate any possible environmental liabilities related to the properties or the project area.

Neither MHA, nor any of our employees, have any interest in the subject property and neither the employment to do this work, nor the compensation, is contingent on our estimates of reserves and resources for the properties in this report.

It has been a pleasure to prepare this evaluation for Leigh Creek Energy. If you have any questions regarding this evaluation, or if additional information is needed, please feel free to contact me.

Sincerely,



Timothy L. Hower  
Chief Executive Officer