

9 February 2022



Syngas Technology Patent Application

Leigh Creek Energy Limited (“LCK”) today announces it has applied to the Australian Patent Office to protect its intellectual property rights pertaining to predicting and controlling syngas operations.

Highlights

- Based on data obtained from the Pre-Commercial Demonstration plant (PCD), LCK has developed proprietary information pertaining to its syngas operations at the Leigh Creek Urea Project (LCUP);
- LCK’s patent allows the control of the syngas quality based on key input parameters;
- The information has considerable commercial application and value and LCK will seek to protect the value of this information via an Australian Patent;
- The quality of the syngas will play a crucial part in delivering the low cost, carbon-neutral urea production from the LCUP.

LCK Managing Director, Phil Staveley, commented:

“The reliable and consistent production of a specified quality of gas is the foundation of any gas business. We have that knowledge in ISG. This patent application is to protect that knowledge. It is likely to be the first of many patents protecting our proprietary information and adding to the value of LCK.”

LCK has developed this proprietary information that is of significant value to the LCUP. The ability to develop this unique commercial technology is a reflection of the highly skilled technical team we have put in place to develop the Leigh Creek Urea Project to produce nitrogen-based fertiliser products for local and international agriculture markets.

Harnessing our global leadership in integrated carbon-neutral fertiliser facilities, this patent will allow us to retain our position of global leadership. Further, we see a considerable commercial opportunity to leverage our proprietary technology in in-situ gasification across the globe and to commercialise our technology capability, helping others to efficiently provide a critical ingredient to the world’s agriculture sector.”

Patent Application – background and justification

Following the successful Pre-Commercial Demonstration (PCD) of in-situ gasification (ISG) technology at Leigh Creek in 2018/19, LCK has developed a comprehensive data base of real-life ISG operating data. Using this information as a basis, LCK has developed algorithms to permit the control of the syngas composition by controlling the key system inputs.

The syngas quality forecasting algorithm provides a means for maintaining the desired syngas composition and quality during the ISG process. The algorithm has been developed to be adaptable to site operating inputs (i.e. depth, coal quality, operating pressure, inlet well length, production well length, gasifier length).

The algorithm may also be used to optimise the production of key syngas components, such as hydrogen or methane.

Following grant of the patent we can apply our unique in-house knowledge in ISG to maintain global leadership. The algorithm will permit the ISG techniques to be used for other coal deposits around the world and for regulating their output composition.

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

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About the Leigh Creek Urea Project

The Leigh Creek Urea Project (LCUP) is Leigh Creek Energy's (ASX:LCK) flagship project, developing low-cost nitrogen-based fertiliser for local and export agriculture markets. Located in South Australia, 550 kilometres north of Adelaide, the LCUP will initially produce 1Mtpa (with potential to increase to 2Mtpa) of urea.

LCK has a comprehensive environment, social and governance strategy. It has produced syngas within all approved environmental parameters set by the regulator and will be **carbon neutral from 2022**.

The LCUP will be one of the biggest infrastructure projects of its type in Australia, providing long term economic development and employment opportunities for the communities of the Upper Spencer Gulf region, northern Flinders Ranges and South Australia. The LCUP will be the only fully integrated urea production facility in Australia, with all inputs for low carbon urea production on-site.

The LCUP will be developed in 2 commercial stages:

Stage 1 consists of:

1. Construction of gasification wells to provide energy (syngas) for the project; and

2. 5 MW gas fired power generation.

Stage 2 consists of:

1. Expansion of gasification fields;
2. 100MW gas fired power generation;
3. Ammonia facility;
4. Urea facility; and
5. Logistics, loading and transport.