

About Leigh Creek Energy



Leigh Creek Energy Ltd is an emerging energy company focused on developing the Leigh Creek Energy Project in northern South Australia.

Headquartered in Adelaide, South Australia with **local** employees and local contractors.

Listed on the Australian Securities Exchange (ASX) under the ASX code of LCK.

Holds Petroleum Exploration Licence 650 (PEL 650) Petroleum Retention Licence 247 (PRL 247) and Petroleum Production Licence 269 (PPL 269), overlying the previously mined Leigh Creek Coalfield.



What is Leigh Creek Energy doing?

Leigh Creek Energy plans to produce urea (fertiliser) and/or hydrogen from coal using a process known as in situ gasification (ISG) at the Telford Basin of the previously mined Leigh Creek Coalfield.

As part of the initial exploration phase, Leigh Creek Energy successfully undertook an ISG demonstration which incorporated construction, operation and decommissioning of a single gasifier chamber and above ground infrastructure to produce synthesis gas (syngas) for the short period of a few months.

Since then, Leigh Creek Energy have prepared Environmental Impact Statements (EIR) and Statement of Environmental Objectives (SEO) for Geophysical Operations and Exploration Drilling Activities, which have been approved by the Government of South Australia. Leigh Creek Energy have also been granted a Petroleum Production Licence, which allows LCK to proceed to the production phase. These documents can be found on the South Australian Government website.

Why the Leigh Creek Coalfield?

The Leigh Creek site is favourable for ISG development as:

- The resource is at depth (over 500m) and has thick seams (10-20m thick)
- The geology is suitable (closed basin with coal at depth with thick mudstone overburden)
- The hydrogeology is suitable (no aquifers or users of groundwater) – Low permeability in the coal seam and surrounding rocks
- Existing infrastructure (roads, power, accommodation)
- Distant from environmentally sensitive areas (National Parks, Great Artesian Basin)
- No land use conflicts

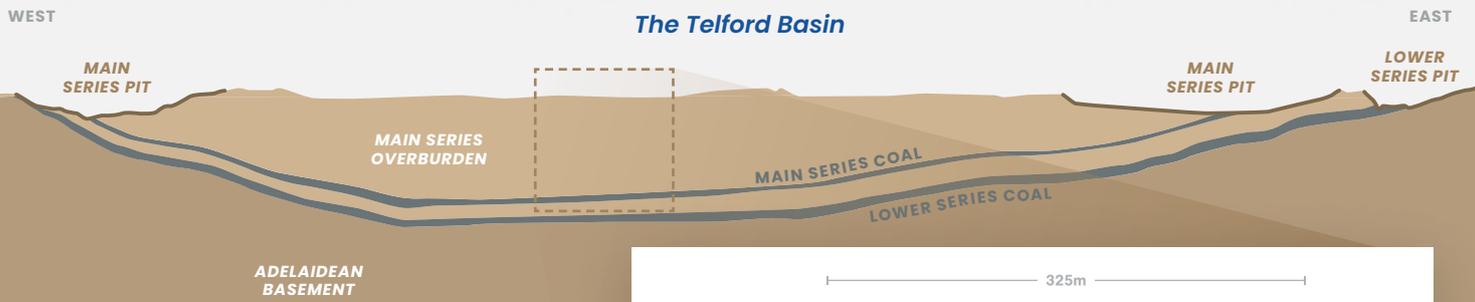
What was the purpose of an ISG demonstration?

Undertaking an ISG demonstration provided information to confirm that LCK can:

- Produce commercial quantities and qualities of syngas
- Operate safely and with minimal impact to the environment

Data obtained from the ISG demonstration allowed:

- Assessment of possible commercial options (e.g. power, pipeline gas, ammonia, urea, hydrogen)
- Development of commercial safety and environmental controls
- Development of commercial plant engineering designs

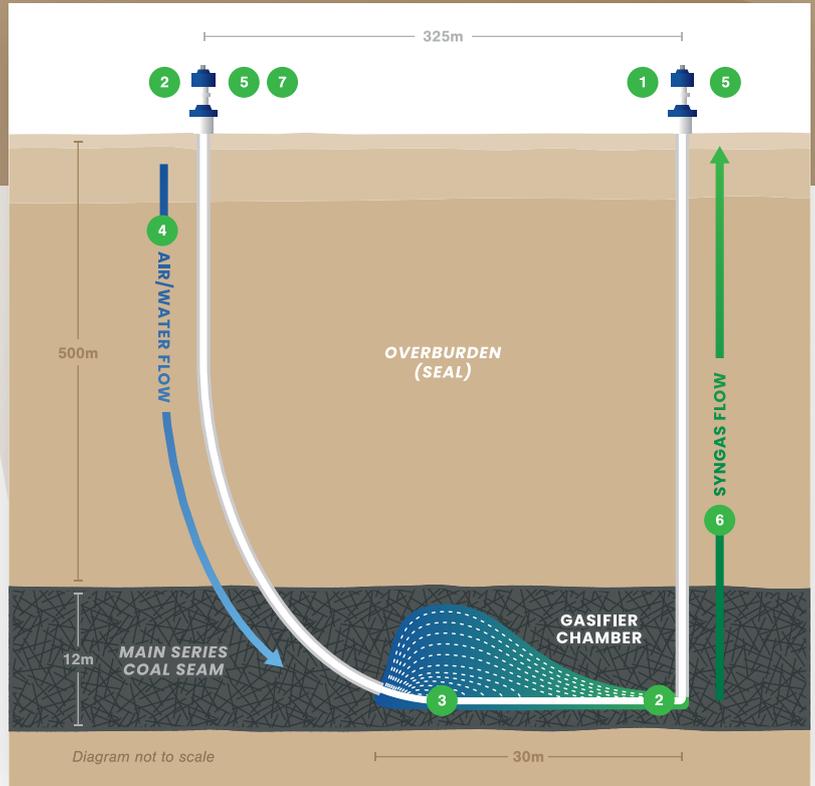


How does the ISG process work?

The ISG process converts coal, through a chemical reaction, 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.

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 the air.



1,153 PJ

Leigh Creek Energy's 2P syngas reserve



LCK's 1,153 PJ of syngas could power all 9.9 million Australian homes continuously for 2.8 years



Pipeline gas

865
petajoules

OR



Ammonia

31
million tonnes

OR



Urea

52
million tonnes

OR



Electricity

240,363
gigawatt hours

Stats: ABS 2016 Census report

Why ISG?

The remaining resource in the Telford Basin at Leigh Creek is deep and no longer economic to mine using open cut mining methods.

ISG technology is able to access the deep coal via a system of drilled linked wells.

Syngas can be used to make other products such as; electricity, synthetic natural gas, ammonia and derivatives (fertilisers or explosives), hydrogen, methanol and diesel.

To obtain information for the design for a commercial facility, Leigh Creek Energy successfully constructed, operated and decommissioned a small-scale ISG demonstration plant during 2018/19. 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 that the technical and environmental performance of the process can be successfully confirmed at Leigh Creek.

Leigh Creek Energy acknowledges and respects the Adnyamathanha people, the Traditional Owners of the land on which our operations occur and pays our respects to their Elders, past and present.

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