Frequently Asked Questions

FACT SHEET

Leigh Creek Energy's in situ gasification (ISG) demonstration project sits within the Telford Basin of the Leigh Creek Coalfield.

Consultation with various stakeholders resulted in many questions on the project being raised. Included here are a series of the most commonly asked questions.

More frequently asked questions can be found in Leigh Creek Energy's Environmental Impact Report.

IN SITU GASIFICATION

What is in situ gasification (ISG)?

The ISG process converts coal, through a chemical reaction, from its solid state into a gaseous form, resulting in the generation of synthesis gas (syngas). For the ISG demonstration, two wells will be drilled into a coal seam, one for the inlet and the other for the outlet and are connected at over 500m below the surface. Air and water are introduced through the inlet well and an initiation device is used to heat the coal and start a chemical reaction in the coal seam. While air and water are still being introduced through the inlet well, syngas will flow through the outlet well where it is analysed. Following analysis, syngas will be destroyed through a Thermal Oxidiser as part of the exploration phase of the project.

What is the difference between ISG and UCG?

The processes are the same. ISG (in situ gasification) is the term used in South Australian legislation, whereas UCG (underground coal gasification) is the terminology used in other jurisdictions across the world.

Is coal seam gas (CSG) or fracking the same as ISG?

No, fracking (hydraulic fracturing) involves injection of water and additives under pressure into the rock formation to open gas flow pathways. The demonstration will direct drill a pathway from well to well. Hydraulic fracturing will not be used for the demonstration plant.

How do you stop the ISG process?

The process can be stopped by turning off the supply (of air and water) from the inlet well, which leads to the ISG reaction ceasing within 48 hours. Once the supply is turned off, the well is quenched with water to decrease the temperature below the threshold whereby pyrolysis products are produced and the ISG reactions cease.

Is the coal burning?

No, however a small amount of coal is consumed when heat is applied, starting the chemical reaction within the coal. If the coal burns it would create carbon dioxide which is not a saleable product. It is important to note that the coal seam is not on fire.

GROUNDWATER

How will you manage and protect groundwater?

Although the rocks contain water, they have been defined as aquitards. This means that the 'tight' rock formations hold water, but the water does not move easily. Due to the slow movement of water underground it cannot be extracted for water supply by wells at the surface. Additionally, there are no aquifers present on site and protection of any groundwater is done through the design and construction of wells to petroleum industry standard with steel casing which is concreted in place.

Why is there so little water and could you have missed it in your investigation?

'Tight' rock formations hold water but it does not move easily. Other groundwater sources are not expected as the basin geology is uniform and well documented.

How do you monitor groundwater changes?

Deep groundwater monitoring wells (approx. 500m), Shallow groundwater monitoring wells (approx. 80m) and Water table wells (approx. 10m) samples are taken for water chemistry to analyse any changes in baseline conditions. This includes salinity, pH and metals.

DEMONSTRATION

How come you are doing this demonstration at Leigh Creek?

The remaining resource at the Leigh Creek Coalfield is deep and no longer economic to mine using conventional methods. ISG technology is able to access the deep coal via a system of linked wells. Leigh Creek was chosen specifically using a series of environmental and technical criteria that made it suitable for an ISG project.

What can Syngas be used for?

Syngas can be used as fuel for a power station, converted to methane for cooking or heating and to produce ammonia products such as fertilisers which SA farmers are currently reliant on for imports.

How do you measure success of the trial and what happens if it is successful?

Success is measured through the result of quality syngas to be used for power generation, that is managed safely and with minimal environmental impact. A successful trial would provide information for the design of a commercial facility.

Where will the gas go from the demonstration plant?

During the demonstration period, gas will be analysed for quality and then destroyed through the Thermal Oxidiser.

ENVIRONMENT

What goes down the inlet well?

Air and water are pumped down the inlet well.

Where does the water come from?

Water will be provided by multiple sources including reclaimed mine pit water as well as from available third-party suppliers such as SA Water. LCK is classified as a Commercial Customer and as such will have to purchase water at SA Water's Commercial Water Price.

What is a Thermal Oxidiser?

The Thermal Oxidiser is a process unit for air pollution control to remove hazardous gases from industrial air streams by destroying them using high temperatures. It has a 98% combustion efficiency of all materials that enter into it (syngas). The small percentage of material that will come out of the top will be steam, water, heat and carbon dioxide.

What about greenhouse gas emissions?

The demonstration plant operation will be short term, and will gather data that will be used to characterise emissions and develop greenhouse gas management strategies for any potential future commercial-scale development.

LEIGH CREEK ENERGY

What next for LCK?

Use technical and environmental outcomes of the PCD to inform commercial studies into developing future industries at Leigh Creek based on ISG. After commercial studies are complete, an Environmental Impact Assessment (EIA) will be conducted. LCK is committed to continuing this process in parallel with community consultation.

How can the community ask questions or give feedback on the project?

Community members can email their questions direct to: **community@lcke.com.au** The Stakeholder Relations team are also happy to meet with stakeholders to discuss the project. Please email the Community email address to organise a meeting.

In what way are you affiliated with Marathon Resources or Linc Energy?

Leigh Creek Energy completed a reverse takeover of Marathon Resources in 2015 as a method of listing on the Australian Securities Exchange (ASX). The sole focus of the company then became ISG at Leigh Creek, rather than previous Marathon Resources projects. New management was put in place at that time. Leigh Creek Energy is in no way affiliated with Linc Energy, the two companies are separate entities, with the latter going into liquidation in 2016.

To obtain information to inform the design for a commercial facility, Leigh Creek Energy proposes to construct, operate and decommission a small-scale ISG demonstration plant. This facility will involve 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 would be commissioned and operated for a short period to produce syngas, so that the technical and environmental performance of the process can be confirmed.

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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