

Underground coal gasification (UCG) converts deeply buried, unmineable coal “in-situ” (in position) into synthesis gas (syngas) that can be used for low-carbon energy production and petrochemical manufacturing. UCG avoids environmental, health and safety risks associated with conventional coal mining by containing the process and most byproducts underground in the original coal seam. UCG-produced syngas can be used directly to generate electricity with gas turbines or converted into synthetic natural gas for local use and export. Syngas is also an excellent feedstock for producing clean-burning liquid fuels including gasoline, diesel and jet fuel as well as production of fertilizer, plastics and other petrochemical products. [Visit stonehornridge.com](http://stonehornridge.com)

Project Overview

Stone Horn Ridge is moving to develop a UCG project to initiate commercial operations and production as soon as 2015. The project site is on remote, CIRI-owned land that is being carefully selected for geologic and hydrologic characteristics to minimize environmental risk. CIRI's core drilling programs have confirmed the existence of significant commercial coal reserves and favorable geology in the project area that can support safe, clean and economic UCG development. The initial project will:

- Provide syngas that can be used to generate electricity, upgraded with methanation into synthetic natural gas for local use and export, or used as feedstock to produce clean liquid fuels, fertilizer or other petrochemical products.
- Offset declining domestic natural gas reserves, bringing price stability and clean, safe and reliable base load power to meet Southcentral Alaska's energy needs.

Proposed Project Site



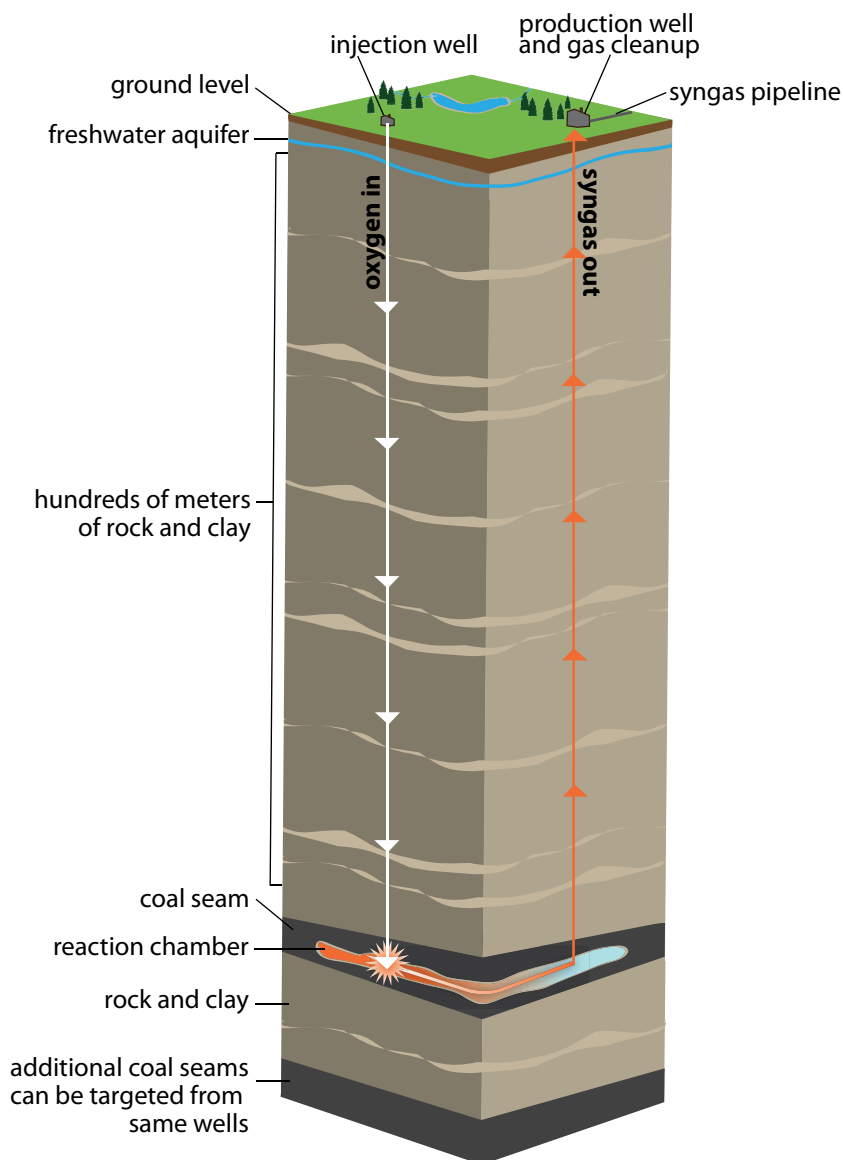
UCG Benefits

- **Supports responsible domestic energy policy:** UCG-produced syngas is a low-carbon, domestic energy resource that diversifies the U.S. energy portfolio and improves economic and national security by reducing dependence on imported oil.
- **Cleaner, safer way to use coal:** UCG requires minimal surface infrastructure and emissions and leaves most coal waste products safely in the coal seam, deep underground. Power produced with UCG-produced syngas leaves a total carbon footprint similar to power generated with natural gas, the cleanest of all fossil fuels.
- **Economic energy production:** UCG is a low-impact, scalable energy technology that is cost competitive with natural gas. Coal energy prices are traditionally lower and more stable than petroleum prices and liquid fuels made from syngas are typically less expensive than equivalent traditional fuels.
- **Utilizes otherwise stranded energy resources:** UCG targets coal that is buried too deep for traditional mining techniques. The U.S. Department of Energy estimates that UCG increases U.S. recoverable coal reserves 300 to 400 percent.
- **Bridge fuel for the future:** UCG-produced syngas can help the nation economically and reliably transition from petroleum to more sustainable energy resources.



How UCG Works

- Injection and production wells are drilled into a deep coal seam that is below strong and impermeable overlying rock layers and isolated from shallower freshwater aquifers.
- Operators pump oxygen into the injection well and initiate a controlled process that uses heat, water and pressure to gasify the coal in the seam.
- The gas moves through a permeable path created in the coal seam to the production well, where it is brought to the surface.
- Syngas is cleaned up and processed for near-site use or transport, leaving ash and most other byproducts deep underground in the coal seam.
- Surface subsidence, groundwater contamination and other risks are mitigated by careful site selection, project design and project monitoring and controls.
- UCG is not coal mining, coal bed methane extraction or hydraulic fracturing (fracking, fracing or hydrofracking).



Project Partners

Stone Horn Ridge is a joint venture of CIRI and Laurus Energy Inc.



CIRI is an Alaska Native corporation and one of 12 Alaska-based regional corporations established by the Alaska Native Claims Settlement Act of 1971 to benefit Alaska Natives who had ties to the Cook Inlet region. The Company is owned by more than 7,400 Alaska Native shareholders of Athabascan and Southeast Indian, Inupiat, Yup'ik, Alutiiq and Aleut descent. It is based in Anchorage and has a well diversified investment portfolio that includes traditional and alternative energy, real estate, tourism, environmental remediation, wireless communications, aerospace defense and private equity and venture capital investments. CIRI is Southcentral Alaska's largest private landowner and has 1.3 million acres of subsurface estate available for responsible gas, oil and mineral development.



Laurus Energy, Inc.

Laurus Energy is a Houston-based UCG developer and the sole North American licensee of the proprietary Exergy UCG™ technology for recovering energy from unmineable coal. Laurus Energy has offices in Montreal and Edmonton, AB. It controls rights to an estimated 13 billion tons of coal.



CIRI has retained Lawrence Livermore National Laboratory as its independent science and technology consultant to help ensure safe, clean and responsible project development, operation and closing.

Carbon Management

Stone Horn Ridge is committed to developing a carbon capture and management program for its project. It expects to use recovered CO₂ from the gas production stream for Enhanced Oil Recovery (EOR) at nearby oil fields. EOR is a proven technology that injects CO₂ or other gases into depleted oil reservoirs and increases oil recovery as much as 50 percent while geologically sequestering the injected CO₂.

