

PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY



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PARTICIPANT

Western Greenbrier
Co-Generation, LLC
Lewisburg, WV



WESTERN GREENBRIER CO-PRODUCTION DEMONSTRATION PROJECT (DISCONTINUED)

Project Description

The Western Greenbrier Co-Production (WGC) project will generate about 100 megawatts of electricity and commercial quantities of salable ash by-products by burning waste coal presently contained in numerous coal refuse dumps in the vicinity of the plant. These refuse dumps, created by coal cleaning operations over the years, presently render the land they occupy unusable and are environmental hazards due to acid mine runoff. Circulating fluidized bed (CFB) combustion is the technology to be used in this project to enable efficient utilization of waste coal. The project will demonstrate the technical and economic viability of a novel Alstom inverted cyclone as a key component in a CFB boiler system.

Western Greenbrier Co-Generation, LLC, owned by the municipalities of Rainelle, Rupert, and Quinwood and incorporated as a tax-exempt entity, will own the facility to be located in Rainelle, WV. The project is expected to serve as a model for other municipalities located in traditional coal-producing regions throughout the country. The project will convert waste coal into salable electric power while remediating environmental hazards, reclaiming thousands of acres of presently unusable land, providing quality jobs in depressed areas, and generally promoting economic development.

The project team consists of B&A, Inc., an architectural and engineering firm; Alstom Power, Inc., a designer and builder of boilers and associated equipment; Hazen Research, Inc., a process development firm; and Penta, Inc., a designer and supplier of cement production facilities. Alstom will supply an atmospheric CFB boiler that incorporates an innovative inverted cyclone and a multi-pollutant control system for SO₂, NO_x, particulates, and mercury emissions (Figure 1). This CFB has a size and footprint that is much smaller than a similar conventional power plant.

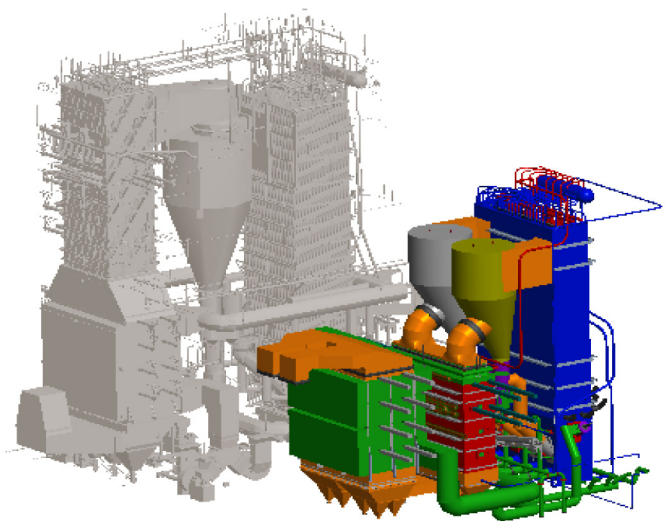


Figure 1. Alstom Power's Inverted Cyclone CFB

ADDITIONAL TEAM MEMBERS

B & A, Inc (owner's engineer)
Alstom Power, Inc.
(technology supplier)
Midway Environmental Associates
(technology supplier)
Hazen Research, Inc.
(technology supplier)

LOCATION

Rainelle
Greenbrier County, WV

COST

Total Estimated Cost
\$214,983,758

DOE/Non-DOE Share
\$107,491,879 / \$107,491,879

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An ash reprocessing facility using Penta's design will convert ash, alumina, and sulfur into a salable cement product. The power plant also will serve as the anchor tenant in an industrial park, and will provide waste heat, steam, and hot water to other tenant businesses (Figure 2).

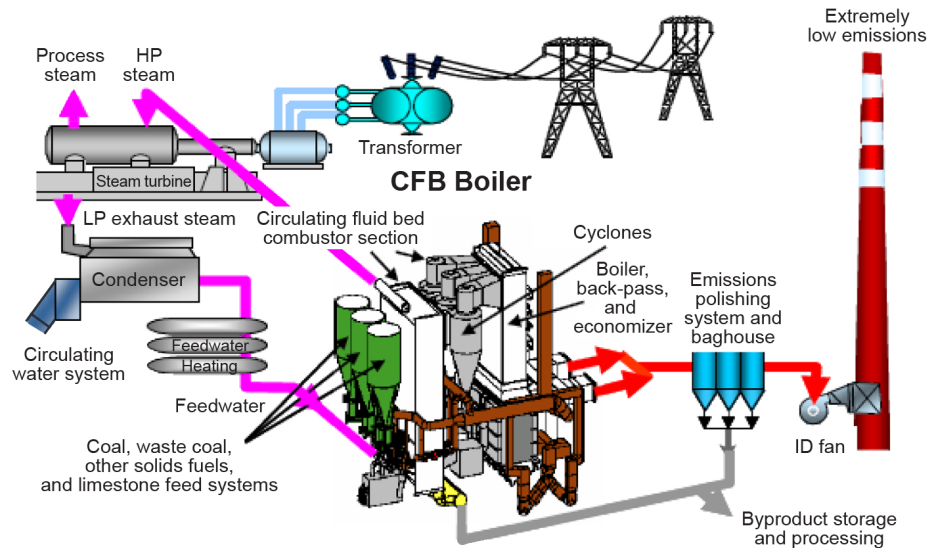


Figure 2. Penta Inc.'s design of a power plant ash reprocessing facility in an industrial park will provide waste heat, steam, and hot water to other tenant businesses within the park.

Benefits

The WGC project will process approximately 4000 tons per day of the coal waste from generations of mining operations, resulting in the following products:

- 100 net megawatts of electricity, waste heat, steam, and hot water for industrial use and district heating
- 100 tons of high-value cement
- 800 tons per day of alkaline ash for waste site remediation of acid mine runoff

After it has been satisfactorily demonstrated, this approach can be utilized in many regions of the country to produce power, good jobs through direct employment and local support industries, and reclamation of thousand of acres of contaminated land where coal waste is presently stockpiled. The state of West Virginia alone is home to an estimated 400 million tons of such waste coal, the legacy of many years of coal production. Similar materials exist wherever coal has been mined and cleaned in the past in the United States and in many other countries as well.

Status

The Western Greenbrier Cogeneration Project was discontinued on June 14, 2008.