

projected demand for electricity in the area failed to materialize. The Kentucky Pioneer IGCC Demonstration Project will be built on the portion of the site that was previously cleared and graded. The site is reached by Kentucky Highway 89 and accessed through a gated perimeter fence and access road. The access road is approximately 1.6 kilometers (1 mile) long from Kentucky Highway 89 to the project site. Plant access by rail would be from a freight rail line owned by CSX Transportation, Inc., which crosses the eastern side of the station. An existing railroad loop approximately 5 kilometers (3.1 miles) long will be used for raw material delivery and product transportation around the 121-hectare (300-acre) project site.

To support the project, EKPC plans to construct a new 138-kilovolt (kV) electric transmission line. The proposed line would extend northeasterly from the project site to the Spencer Road Terminal in Montgomery County, Kentucky, where it would interconnect with the existing local power grid. This transmission line would provide additional capacity adequate to accommodate the addition of the Kentucky Pioneer IGCC Demonstration Project and is consistent with the master plan for transmission outlets required for existing and future generation at EKPC's J.K. Smith Site. The proposed new transmission line would be approximately 27 kilometers (17 miles) in length, though the specific route for the line has yet to be determined. However, in the FEIS, DOE has examined, as appropriate, the general impacts that would be expected from this type of line.

The U.S. Department of Agriculture, Rural Utility Service (RUS), has approval authority for the capacity upgrade of the transmission line. Under RUS NEPA policies and procedures (7 CFR part 1794), RUS will prepare appropriate NEPA analysis of the impacts associated with the transmission line.

The proposed project will be comprised of two parts: the "power island" and the "gasification island." The power island will be comprised of two combined cycle turbine units that would generate most of the electricity at the site. These units could run on a natural gas feed or a synthesis gas (syngas) feed generated from Refuse Derived Fuel (RDF) pellets and coal in BGL gasifier units. The gasification island will consist of the following major facility components: (1) RDF pellet and coal receipt and storage sheds; (2) gasification plant; (3) sulfur removal and recovery facility; and (4)

air separation plant. The production of syngas in the BGL process occurs in the gasification plant and utilizes the sulfur removal and recovery facility and air separation plant.

The syngas firing process consists of the following four steps: (1) Generation of syngas from RDF pellets and coal reacting with steam and oxygen in a high temperature chemically reducing atmosphere; (2) removal of contaminants, including particulates and sulfur in the sulfur removal and recovery facility; (3) clean syngas combustion in a gas turbine generator to produce electricity; and (4) recovery of residual heat in the hot exhaust gas produced by the gas turbine. The residual heat will be used to generate steam in a heat recovery steam generator that produces additional electricity in a steam turbine, which is the combined cycle aspect of the plant.

The solid fuel source for the Kentucky Pioneer IGCC Demonstration Project will be high sulfur coal and RDF pellets. RDF pellets will be procured from a RDF pellet manufacturer. The two fuel sources will be shipped by rail directly to on-site storage. At a minimum, 50 percent of the feed will consist of high-sulfur coal from the Kentucky region during the one-year demonstration period.

KPE intends to use high sulfur coal for direct delivery to the project site. Western Kentucky coal is generally considered the high-sulfur coal region; however, Eastern Kentucky may also provide high-sulfur coal supplies. Project economics will determine the supplier and the type of coal supplied. The facility will require approximately 1,125 kilograms (2,500 tons) per day of coal, which equates to about 25 railcars per day. Compared to entirely coal-fired electric generation technologies, this project will require less coal consumption to generate 540 MW.

RDF is manufactured in a process that includes controlled steps for the processing of municipal solid waste (MSW) or common household waste. RDF pellets are stable and durable because they are made with relatively low moisture content. The process results in pellets with a relatively uniform size and shape and generally uniform energy content. RDF pellets also have a relatively low ash content and good handling and storage life before use. The RDF pellets will be procured from an existing manufacturer. RDF pellets are typically extruded into a uniform dense shape that makes them well suited to transportation and storage. The Kentucky Natural Resources and Environmental Protection Cabinet has determined that

the pellets to be used in this facility qualify as RDF.

The production of syngas in the Kentucky Pioneer IGCC Demonstration Project facility will occur in a carefully controlled environment. Gasification technology is known to produce a very consistent syngas product, regardless of the variability of the feed. Though the RDF pellet composition is expected to be relatively constant, slight variations in the composition would have no effect on the composition of the syngas produced. The resulting syngas is expected to be 55 percent carbon monoxide (CO), 30 percent hydrogen gas, 10 percent carbon dioxide, 5 percent methane and ethane, with a relatively small amount of sulfur in the form of hydrogen sulfide.

### Alternatives

Congress directed DOE to pursue the goals of the CCT Program by means of partial funding of projects owned and controlled by non-federal sponsors. This statutory requirement places DOE in a much more limited role than if the federal government were the owner and operator of the project. In the latter situation, DOE would be responsible for a comprehensive review of reasonable alternatives for siting the project. However, in dealing with an applicant, the scope of alternatives is necessarily more restricted because DOE must focus on alternative ways to accomplish its purpose that reflect both the application before it and the role DOE plays in the decisional process. It is appropriate in such cases for DOE to give substantial weight to the applicant's needs in establishing a project's reasonable alternatives.

Based on the foregoing principles, the only reasonable alternative to the proposed action is the no-action alternative. The EIS includes two no-action alternative scenarios, which are discussed below. Other alternatives that did not meet the goals and objectives of the CCT Program, or the applicant, were dismissed from further consideration.

### Proposed Action

Under the Proposed Action, DOE will provide, through a Cooperative Agreement with KPE, financial assistance for the design, construction, and operation of the proposed Kentucky Pioneer IGCC Demonstration Project. All associated facilities for the power and gasification islands, including fuel storage, rail car unloading sites, and air emissions control equipment, will be constructed under the Proposed Action. In addition, EKPC plans to construct an electric transmission line. The proposed project would be designed for at least 20