

steam near Gilberton, Schuylkill County, Pennsylvania.

The liquid hydrocarbon products would include clean diesel fuel and naphtha. The new plant would use four major technology systems: (1) Gasification technology from Shell, which would be particularly suitable for processing the high ash (40%), low cost, anthracite coal waste that would provide the primary feed to the plant. The gasification process would produce raw synthesis gas consisting primarily of carbon monoxide and hydrogen; (2) raw synthesis gas treatment and cleaning technology systems to remove solid particulate matter and gaseous contaminants to trace concentrations; (3) indirect liquefaction for converting cleaned synthesis gas into synthetic hydrocarbon liquids using Fischer-Tropsch (F-T) technology from SASOL Technology, Ltd., and (4) combustion of cleaned, unconverted synthesis gas in a gas turbine/combined cycle power plant to produce electricity and steam.

The Gilberton Project would be located on an approximately 50-acre site near Gilberton, PA, north of Interstate 81 and east of Pennsylvania State Highway 61, off Morea Road. The site for the Gilberton Project would be adjacent to the eastern boundary of the existing 80 MW Gilberton Power Plant, which has been operating continuously since 1986 using circulating fluidized-bed combustion technology to process anthracite coal waste. Site preparation would require grading, clearing of vegetation, and addition of infrastructure improvements, such as roads, fencing, and drainage. Construction preparations would include installation of concrete piers and foundations for the plant equipment and structures.

The primary feed material for the Gilberton Project would be up to approximately 4,700 dry tons-per-day of anthracite coal waste, which is abundant locally in legacy waste piles from old mining practices. These anthracite tailings, which are potential sources of soil and water contamination, would be reclaimed for the Gilberton Project from the surrounding area, although the plant would also be capable of processing feed containing a blend of anthracite waste with petroleum coke, other coals, or biomass.

Air separation would be used to produce a high purity oxygen stream for the Shell gasification process. The anthracite waste, combined with about 400 tons-per-day of a fluxing agent such as limestone to assist with maintaining ash in a molten form, would be processed through a Shell gasifier to produce a raw synthesis gas that would

be cleaned to produce approximately 200 million standard cubic-feet-per-day blend of primarily hydrogen and carbon monoxide. The mineral content of the anthracite waste and the fluxing agent fed to the Shell gasifier would produce about 2,000 tons-per-day of molten slag and 160 tons-per-day of collected dry particulate that could be used as construction materials.

Cleaning of gas from the Shell gasifier would be achieved using a combination of initial quenching to remove any entrained molten slag, filtration to remove dry particulate, scrubbing to remove any residual solid particles and alkali salts, catalytic removal of sulfur compounds, and treatment in a Rectisol unit to remove carbon dioxide. The gas cleaning processes would remove impurities and produce a carbon dioxide stream that could be used for future sequestration if economics permit, although sequestration is not part of the proposed project.

The cleaned synthesis gas would be processed through a low-temperature F-T unit and downstream product treatment units to produce about 5,000 barrels-per-day of ultra-clean diesel fuel and naphtha, which would be virtually free of sulfur, nitrogen, and aromatic compounds and superior in both end-use and environmental properties compared with liquid hydrocarbon products produced from petroleum refining. Operations could be altered to change the distribution of products, including kerosene that would service specialty jet fuel markets, and to produce alcohols and liquefied petroleum gas. The F-T liquid products would be readily marketable to the refining industry. Diesel product from F-T synthesis possesses a high Cetane value and has demonstrated significantly reduced engine emissions of particulate matter, nitrogen oxides, hydrocarbons, and carbon monoxide, while meeting all current fuel specifications and the expected future (2006) Environmental Protection Agency specification for low sulfur fuels. Naphtha product can either be readily upgraded to a high-octane, clean reformulated gasoline or used as an on-board, sulfur-free feed to a reformer to produce hydrogen for fuel-cell-powered vehicle applications.

Unconverted, cleaned synthesis gas from the F-T unit would be combusted in a gas turbine/combined-cycle power plant to produce electricity for the Gilberton Project and for export to the local power grid. High pressure and medium pressure steam produced in the plant would be used to produce additional power using steam turbo-generators. Excess steam from the power

plant system would be marketed to local customers. Other potentially marketable byproducts from the plant would include elemental sulfur and a vitrified material resembling coarse sand that could be used in the construction and building industries.

Wastewater, including contaminated runoff from the project site, would be handled using a combination of storm water retention, wastewater treatment, oil recovery, biological treatment and solids removal, and disposal. Water treatments would include equalization, API separator treatment for oil removal and recovery, dissolved air flotation for additional oil removal, and biological treatment.

Construction of the proposed plant would be expected to require approximately 30 months. Plant start-up, system and feedstock testing, and long-term performance and reliability demonstration under the cooperative agreement with DOE would require approximately 27 months, after which the plant could continue in commercial operation.

Successful demonstration of technology in the Gilberton Project would generate opportunities for a broad range of commercial applications, especially in coal producing and consuming regions of the United States. Commercial applications would result in substantial socioeconomic benefits to the coal regions, including direct and indirect job stimulation and the related benefits of enhanced productivity and tax revenues; environmental benefits of abandoned mine land reclamation as coal waste is converted into high value products; and increasing energy independence.

Alternatives

NEPA requires that agencies evaluate the reasonable alternatives to the proposed action in an EIS. The purpose for agency action determines the range of reasonable alternatives.

The Clean Coal Power Initiative (CCPI) was established to help implement the President's National Energy Policy (NEP) recommendation to increase investment in clean coal technology by addressing national challenges of ensuring the reliability of domestic electric and energy supplies while simultaneously protecting the environment. The CCPI program was structured to achieve NEP goals by promoting private sector initiatives to invest in demonstrations of advanced technologies that could be widely deployed commercially to ensure that the United States has clean, reliable, and affordable energy. Private sector investments and deployment of energy