

PROJECT facts

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

Transportation Fuels
and Chemicals

06/2004



PRODUCTION AND DEMONSTRATION OF SYNTHESIS GAS-DERIVED FUELS

Description

The objectives of this project are to:

- Demonstrate a small footprint Gas-to-Liquids plant to produce ultra clean synthetic fuels
- Test the ultra clean fuels in bus fleets in Washington DC and Denali National Park and in stationary applications in rural Alaska
- Provide a well-to-wheels economic evaluation of moving a small Gas-to-Liquids processing plant to a variety of currently stranded fossil fuel feedstocks



Small Footprint Plant

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Many fossil fuels are located in hard to access places, which make them uneconomical as feedstocks. Other sources such as coal fines, refinery wastes, and landfill gases are generally economic burdens and environmental hazards that are currently unusable as energy resources. The

ability to move a Small Footprint Plant (SFP) into these locations will result in these currently useless resources being converted to high-cetane, ultra clean fuels, with non-detectable sulfur and aromatic levels, for both production engines and advanced engine technologies.



Synthesis Gas-Derived Fuel

These hydrogen saturated synthetic fuels have been shown to reduce harmful emissions by substantial amounts in stationary vehicular engine tests. However, longer term tests are needed to demonstrate the fuel's practicality in commercial settings. This project includes: over-the-road commercial bus tests in



LEAD INDUSTRY PARTNER

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Tiax, LLC
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COST SHARING

DOE	\$18 million
Non-DOE	\$20 million

Washington, DC and Alaska; cold-starting and cold-operation testing; evaluations of after-treatment systems; use of exhaust gas re-circulation (EGR); and varied injection timing. More extensive testing is particularly relevant for evaluating emissions reduction, drive-train efficiency, fuel blends and additives.

Fuel test data and cost data, derived in part from construction and operation of the Syntroleum SFP, will be used to develop a well-to-wheels economic analysis. The economic analysis will include likely market thresholds for an eventual substitution of synthesis gas-derived ultra clean fuels for conventional fuels. While already attractive from an environmental perspective, these ultra clean fuels are also anticipated to become more economically competitive. Conventional fuels are increasingly derived from "sour" crudes that are more costly to refine. Since U.S. needs are projected to rise, and refining costs are increasing, the market price of fuel is expected to continue to climb.

The production process and fuel being demonstrated by this project could also have a number of advantages for military applications, including the ability to produce fuel closer to the location of conflicts than was possible in the past. One of the primary advantages of this concept for military applications is the ability to produce ultraclean fuel from a variety of domestic and foreign resources.

To perform this project, Integrated Concepts and Research Corporation (ICRC) has assembled a team that will construct and operate the SFP, test the fuels, and carry out a well to wheels economic evaluation of the SFP concept (see list of participants).

Project Highlights

- DOE contract awarded in July 2001
- SFP pilot plant dedication in October 2003
- First fuel shipped from plant in April 2004
- Fleet testing in Denali National Park and Washington DC scheduled for Summer 2004



Artist's concept of commercial bus used for fleet test