



the **ENERGY** lab

PROJECT FACTS

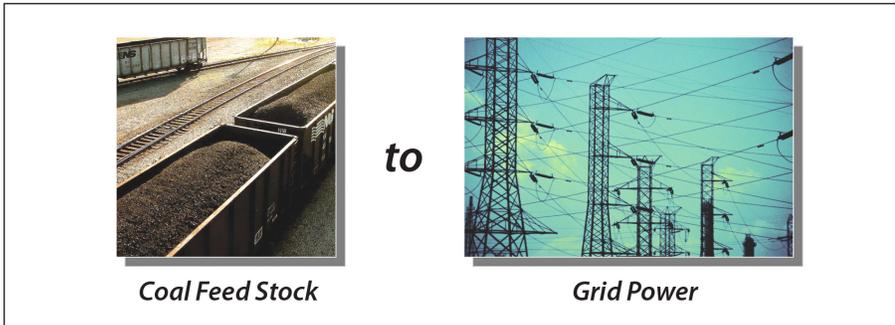
Hydrogen & Clean Fuels from Coal

Yeager Airport Hydrogen Production and Dispensing Facility

Description

The Department of Energy's National Energy Technology Laboratory (NETL) is to install a hydrogen fuel production and vehicle fueling facility for operation at the Yeager Airport in Charleston, WV. Designed as a research, development, test, and evaluation (RDT&E) platform, the "open architecture" approach will allow for testing of new innovations in hydrogen technology.

Hydrogen is considered the fuel of the future because it does not produce air pollutants when used - clean water is the only byproduct. Hydrogen production can be achieved while capturing greenhouse gases from a variety of sources, all of which are plentiful in the United States. The electricity for the electrolysis of water to produce pure hydrogen fuel, as planned at the Yeager facility, comes from coal-based power generation.



Hydrogen is used in modified internal combustion engines or in fuel cell vehicles. The open system architecture centers on two value propositions: (a) two cents worth of water holds a kilogram of hydrogen and is an excellent feedstock for production by electrolysis using electric power and (b) off-peak grid electricity is undervalued and can be effectively used in hydrogen production.

Commissioning and operation of the facility is anticipated for August 2009, with testing and evaluation to continue for two years. Production is expected to be 12 kg/day (approximately equivalent in energy content to 12 gallons/day of gasoline). The hydrogen produced by the facility will be used by the airport's operations and the 130th Air Wing of the West Virginia Air National Guard.

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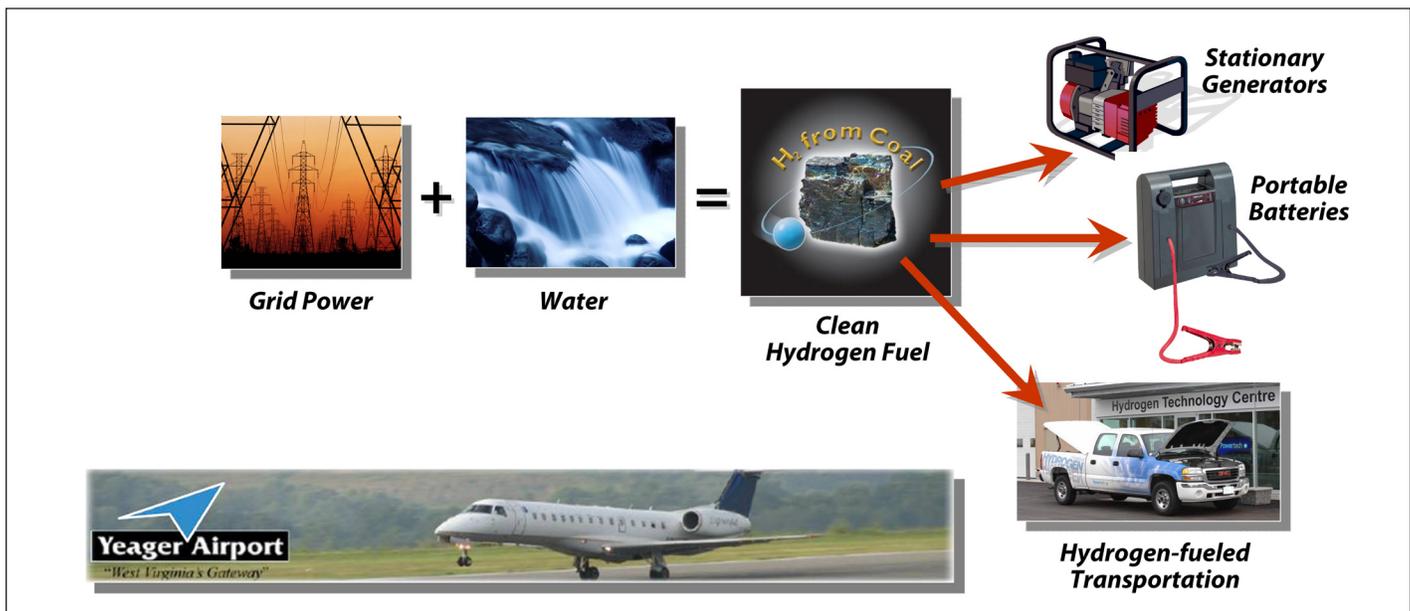
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U.S. DEPARTMENT OF
ENERGY



Project Goals

In support of the national objective of making hydrogen a viable energy option, one goal of this facility is to demonstrate the feasibility of hydrogen fuel as a safe and price competitive alternative to petroleum. The RDT&E Platform is the first openly documented approach in the nation designed to deliver H_2 fuel at petroleum-derived gasoline prices. The test program will establish a publically available and objective database for regional systems of this type. With the "open architecture" approach, flexibility will be created to promote simplistic interfacing and adroit "swap in" of new product technologies, thus providing the ability for small businesses, universities, and entrepreneurs to validate their innovations in-situ of a fully functional hydrogen energy facility.

The program also has a goal to educate users, first responders, industry, and the general public (beginning first in the State of West Virginia) about the safe use of hydrogen and the fossil fuel-to-hydrogen programs. This program will not only help make hydrogen acceptable to the citizens of West Virginia, but could readily make West Virginia (one of the most energy conscious states in the country) a leader in the use of hydrogen. NETL will be operating an interactive website that is open for public monitoring of the RDT&E Platform's performance, reliability, and operating costs. With this website and the ability for simple facility replication into other areas, an additional project objective of encouraging communities and stakeholders to work together to build the nation's hydrogen infrastructure can be met.

Status

The equipment and facility designs have been completed for all three portions of the facility, including Hydrogen fuel production, medium pressure storage, and dispensing. The designs incorporate the use of off-the-shelf (OTS) components to promote design simplicity, while providing for the ease of facility replication at future additional sites. The goal to create

a facility design that is modular and expandable in nature has been met and will support the capability for test and evaluation of numerous OTS and advanced innovative system components. A suitable location for the facility has been offered by the Yeager Airport, located in Charleston, WV, and the major long-lead pieces of equipment have been ordered. The preliminary layout for the construction of the test pad in Aiken, SC has been completed and the required building and site use permits have been obtained.

Anticipated Benefits

The NETL RDT&E Platform will support the national objective of making hydrogen energy a viable option and will provide opportunities for DOE's industrial partners, small businesses, and universities to verify functionality of their technological innovations in context within an operating system. This technological verification will accelerate the successful commercialization progress necessary to equip the nation with a complete hydrogen energy capability.

This production and fueling facility will educate the general public on the use of hydrogen as a safe energy source for transportation and industrial support. Through the completion of facility fabrication and operational shakedown, lessons learned will be identified to streamline the construction, operability, and maintenance of future facilities. The Yeager facility will be the first step in the establishment of a hydrogen corridor from Charleston, WV to other cities such as Morgantown, WV and Pittsburgh, PA. With two years of facility operation and technology verification, an estimated 20 jobs per year will be created.

