

PROJECT facts

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

Fuel Cells

10/2002



PRIMARY PROJECT PARTNERS

International Fuel Cells
South Windsor, CT

U.S. Army CERL
Champagne, IL

PHOSPHORIC ACID FUEL CELL COMMERCIALIZATION

Description

International Fuel Cells (IFC) of the U.S. is the only manufacturer of commercial fuel cell units in the world. This company has the capability to produce 200 PC25™ units per year in its facility using robotics manufacturing and automated assembly techniques. The PC25™ converts 1900 SCF per hour of natural gas or approximately 3,500 SCF per hour of biogas into 200 kW of grid-connected or grid-independent premium power and up to 900,000 Btu/hr of useful thermal energy at up to 250°F.

Goals

Well over 200 PC25 fuel cell power plants have been delivered from IFC as of October 2000.

Thirty-six (36) units have operated more than 30,000 hours, and thirteen (13) have surpassed 40,000 hours with the longest operating PC25 topping the 52,500 hour mark. Three units in Japan have had the longest continuous operation runs in excess of 9000 hours (greater than one year).

The fleet continues to show an impressive availability. The worldwide fleet has now operated for over 3,600,000 power plant operating hours.

DOE's Office of Fossil Energy was instrumental in supporting the development of PAFC stack and system technology.

Continued efforts include a cooperative government/private sector partnership at no additional cost to the government.



*Integrated, Assured Power System
at the First National Bank of Omaha*



PHOSPHORIC ACID FUEL CELL COMMERCIALIZATION

Benefits

The PC25 demonstrates the technical viability and environmental cleanliness of fuel cell technology. These fuel cells have been sited, permitted, installed, started, operated, and maintained in a real world environment. The fleet continues to demonstrate reliable, safe operation in a variety of climates, applications, and service scenarios. Ambient temperatures range from sub-zero to plus 100°F. The table below shows the results from PC25 operation by U.S. owners. A significant premium power market is emerging for the PC25, in which the fuel cell's stable, and quality electric output is providing energy service to critical loads in commercial buildings. PC25s have been installed as back-up generators, as well as the primary source of supply for dedicated loads, replacing conventional uninterruptable power supplies. Other units are demonstrating the fuel flexibility of fuel cell power plants by operating on biomass, hydro-gas and butane. In addition IFC is now delivering units with dual fuel capabilities.

CONTACT POINTS

John Trocciola

International Fuel Cells
South Windsor, CT
860-727-2388
860-727-2666 fax
Troccioc@ifc.utc.com

Mark C. Williams

Fuel Cells Product Manager
U.S. Department of Energy
National Energy Technology
Laboratory
MS-D01 P.O. Box 880
Morgantown, WV 26507-0880
304-285-4747
304-285-4216 fax
mark.williams@netl.doe.gov

Mike Binder

US Army, CERL
217-373-7214
217-373-3430 fax
m-binder@cecer.army.mil

Major North American PC25 Owners' Findings

| Category | Result | Comment |
|--------------------------|--|--|
| Target Installation Cost | \$50,000 to \$100,000 | Simple and short interconnects |
| Permitting | Nothing unusual | Units have AGA approval/seal, some states have blanket EPA permits. New York City MEA approval |
| Electrical Interfaces | Grid Connected and/or Grid Independent parallel | Widely accepted by electric utility |
| Maintenance | Over 9000 hours between major maintenance demonstrated | PC25C annual maintenance IFC or other contractors available for maintenance |