Use the Binocular Icon in Acrobat Reader to Search this Document

FUEL CELLS 2000
www.fuelcells.org

Worldwide Fuel Cell Installations

Fuel cell Manufacturer	Project Partners	Fuel cell	Location	Building	Start date	Status	Fuel used	Picture	Comments / Contact Information
American Fuel Cell Corp., Plug Power, H Power, DCH Enable	EPRIGEN Buy Down Recipient FY1998	Sixteen 3 kW PEM systems	Palo Alto, CA	Testing Facility	1999	Compl.			EPRIGEN performs many tests on fuel cell units they've purchased or they go on-site to the manufacturer.
Multiple US and foreign-based FC manufacturers including Acumentrics, Avista Labs, Ballard, Enable, HyRadix and Plug Power	HARC with Dana Corp., Texaco, Southern Co., Salt River Project Sponsorship open to all organizations except fuel cell manufacturers	Various PEM and SOFC models and sizes intended for residential, UPS and APU markets Avista Labs' 3kW is First demo	The Woodlands, Texas	Houston Advanced Research Center (HARC)	1999	Ongoing	Natural Gas, Hydrogen and Propane		HARC's program is to evaluate fuel cell equipment and verify manufacturer performance claims. HARC: Dan Bullock dbullock@harc.edu 281-364-6087 HARC: (281) 363-7908 Barbara Peyton bpeyton@harc.edu
Ansaldo Fuel Cells Spa (AFCO)		100 kW MCFC	ENEL site near Milan, Italy		98-99	Compl.	Natural Gas		Proof of Concept
Ansaldo Fuel Cells Spa (AFCO)		100 kW MCFC	IBERDROLA site of Guadalix, near Madrid (Spain)	stack test and conditioning facility	1999	Compl.	Natural Gas		
Apollo Energy Systems Inc.	Apollo Energy and Hydrolec Inc.	10 kW Apollo Alkaline fuel cell w/ 12 kWh lead-cobalt battery	Ft. Lauderdale, FL		2002	In production			2,000 Apollo power plants per month to Hydrolec used for power back up and elevator systems around the world; starting in 2002. Worth $223.0 million. Recently acquired Zetek's AFC factory.
Ballard	Ballard / Belgium	250 kW Stationary Generator	Liege, Belgium		2001	On going			
Ballard	Alstom / Bewag AG	250 kW Stationary Generator	Berlin, Germany	Bewag's Treptow Heating plant	June 2000	On going	Natural Gas		The BEWAG project is for public education. It involves a closed fuel circuit comprised of photovoltaics and an electrolyzer.
Ballard	Cinergy Technology Inc.	250 kW Stationary Generator	Crane, Indiana	Crane Naval Surface Warfare Center	Sept. 1999	Ended 2001			First 250 kW PEM fuel cell generator in the world to enter field testing. Each Ballard PEM power plant will undergo 2 years of testing with the overall program complete in 2004
Ballard	Nippon Telegraph & Telephone (NTT) / Ebara	250 kW Stationary Generator	Tokyo, Japan	NTT research lab	2000	On going			This unit utilizes a cogeneration system incorporating an adsorption chiller (for air conditioning) developed by EBARA.
Ballard	Ballard / Japan	250 kW Stationary Generator	Tokyo, Japan		2001	On going			
Ballard	Alstom / Elektra Birseck (EBM)	250 kW Stationary Generator	Basil, Switzerland	EBM headquarters	2000	On going			

Ballard	"PEM-Oberhausen" project	250 kW Stationary Generator CHP with Microturbine	Fraunhofer Institute for Environmental, Safety and Energy Engineering (UMSICHT)		2002	On Going	Natural Gas		The overall energy concept contains a PEMFC (polymer electrolyte membrane fuel cell) as a container plant for the generation of electricity and heat in combination with a microturbine http://www.pem-oberhausen.de/englisch/index.html
DCH Tech.	DOD Residential Fuel Cell Demonstration Program Brooks AFB	3 kW (3 units)	San Antonio, TX	Base Housing	Oct. 2002	Not installed	Natural gas		Company no longer in business.
DCH Tech.	DOD Residential Fuel Cell Demonstration Program Ft. Bragg	3 kW (1 unit)	Fort Bragg, NC	TBA	Dec. 2002	Not installed	Natural Gas		Company no longer in business.
Fuel Cell Technologies (FCT)	The Presidio Trust Buy Down Recipient FY2000	One 5 kW SOFC system	San Francisco, CA		Second half of 2002				Gary Allen, Marketing, [ext 114] gallen@fct.ca Phone: (613) 544-8222
Fuel Cell Technologies (FCT)	NFCRC	One 27 kW SOFC system	University of California, Irvine	Demonstration unit	Since 1998; new 5 kW unit in 2002	Used as a teaching model	Various – NG/Diesel /JP-8		2 generations of Siemens fuel cells: 1) white tubes and 2) black tubes Gary Allen, Marketing, [ext 114] gallen@fct.ca Phone: (613) 544-8222
Fuel Cell Technologies (FCT)	US National Park Service, BPA	Two 5 kW SOFC CHP systems	Yosemite National Park, California	Administration building	Never Installed		Propane		Two Plug Power systems will be installed early 2004 Mira Vowles 503.230.4796 mkvowles@bpa.gov Gary Allen: gallen@fct.ca
Fuel Cell Technologies (FCT)	Hammarby Sjostad project	Two 5 kW SOFC CHP systems	Stockholm, Sweden		August, 2002	To be delivered			
Fuel Cell Technologies (FCT)	AQMD	One 5 kW SOFC CHP systems	California	AQMD	End of 2002	To be delivered			
FuelCell Energy with Yale	Connecticut Clean Energy Fund and Yale University	250 kW	New Haven, CT	Environmental Science Center	Dec. 2003	Dedicated	Natural Gas		
FuelCell Energy	PPL Energy Plus, Starwood Hotels and Resorts	250kW Direct Fuel Cell (DFC)	New York, NY	Sheraton New York Hotel and Towers	April 2004	To be installed			
FuelCell Energy	MTU	250 kW DFC (Hot Module #1)	Bielefield, Germany	University of Bielefield	11/99		Natural Gas		
FuelCell Energy	Salt River Project	250kW DFC	Mesa, Arizona	Arizona State University East Campus	Late 2004, early 2005	To be delivered			
FuelCell Energy	LOGANEnergy, US Coast Guard Station	5kW PEM fuel cell	New Orleans, LA	US Coast Gurard Station	November 2003	In operation			
FuelCell Energy	USCG Air Station Cape Cod Fuel Cell Project	250 kW MCFC	Cape Cod, MA	USCG Air Station (w/ hot water)	May 2003	Installed and Tested	Natural Gas		Involves: PPL Spectrum, PPL Savage Alert, Millennium Builders, Fuel Cell Energy, Mass Tech Collaborative, NSTAR, and

 Created by Fuel Cells 2000, All Rights Reserved

									the Coast Guard (ASCC, CEU Providence, R&D Center)
FuelCell Energy	City of LA / American Airlines Air Freight Buy Down Recipient FY2000	One 250 kW MCFC system	Los Angeles, CA	American Airlines Freight					
FuelCell Energy	Ppl Spectrum, Inc. Buy Down Recipient FY2000	One 250 kW MCFC system							
FuelCell Energy with MTU		250 kW DFC (Hot Module #2)	Bad Neustadt, Germany	Rhoen-Klinikum AG Hospital	10/00				
FuelCell Energy	RWE AG, MTU Daimler Chrysler AG	250 kW	Essen Germany		July 2003	Joint venture established			
FuelCell Energy	MTU CFC Solutions Gmbh		Karlsruhe, Germany	Michelin tire plant	Feb 2003	Begun operation			
FuelCell Energy	Wabash River Energy, IGCC Buy Down Program	2 MW	Wabash River Energy, IGCC	Clean coal operating plant	10/2003	Final stages of contrsuction	combination of coal and renewable fuels		It is the first Clean Coal Technology plant to employ a fuel cell and run on a combination of coal and renewable fuels. Originally set to operate at the still under development Kentucky Pioneer Energy IGCC site, it has been moved to Wabash River in order to start operation 2 years a head of schedule.
FuelCell Energy	FuelCell Energy Facility Demonstration	250 kW DFC	Danbury, CT	FuelCell Energy's Facility	Feb. 1999	Off line as of June 30, 2000		It was grid-connected. After post-demo analysis, this plant will be modified to accommodate both a fuel cell and a gas turbine for another demonstration.	
FuelCell Energy	Alabama Direct FuelCell Demonstration Project (Hot Module)	250 kW DFC	Tuscaloosa, AL	Mercedes Benz Production Facility	Dec 2003	Completed			7260 Btu/kWh = rated output
FuelCell Energy	DOE Harrison Mining Corp	200kW DFC	Hopedale, OH	Coalmine Methane Test Site			Coalmine Methane Gas		www.fce.com
FuelCell Energy	King County Digester/Fuel Cell Demonstration	1 MW DFC	King County, Washington	Municipal waste treatment system	2003	Under construction	Methane rich gas (digester gas)		www.fce.com
FuelCell Energy	Los Angeles Department of Water and Power US Army Coprs pf Engineers Buy Down	250 kW MCFC DFC 300	Downtown LA	LA Depart. of Water and Power headquarters	Dec 2003	Trial plant replaced with permanent model	Natural Gas		www.fce.com

 Created by Fuel Cells 2000, All Rights Reserved

	Program Recipient FY1999								
FuelCell Energy	Los Angeles Department of Water and Power Buy Down Program Recipient FY2000	250 kW MCFC	Los Angeles, CA	Sewage plant	Planned for later in 2002	To be delivered in 2002	Digester gas from sewage plant		www.fce.com
FuelCell Energy	Los Angeles Department of Water and Power Buy Down Program Recipient FY2001	250 kW MCFC	Los Angeles, CA	LA International airport	Planned for later in 2002	To be delivered in 2002			www.fce.com
FuelCell Energy	Los Angeles Department of Water and Power (LADWP)	2 MW DFC	Santa Clara, CA	Scott Receiving Station	mid-1990s	Completed			First full scale utility demonstration of a molten carbonate fuel cell system
FuelCell Energy	Los Angelos Departmnet of Water and Power and Los Angelos Deprtment of Public Works and Sanitation US Army Corps of Engineers Buy Down Program	250kW DFC	Terminal Island, San Perdo, CA		Operation started	May 2003	Natural Gas	 **HYPERLINK "http://www.fce.com/site/products/"**	Plans to operate on sewage gas by summer 2004 www.fce.com
FuelCell Energy	Starwood Hotels	250 kW	Parsippany and Edison, NJ	2 Starwood Sheraton Hotels	Fall 2003	Installation and Testing complete	Hydrogen		Partnered with New Jersey Clean Energy Program ($1.7 million).
FuelCell Energy	Grand Valley State University, Michigan Public Service Commission		Muskegon, MI	Research Center	May 2003	Under Construction			
FuelCell Energy	USDOE, Global Energy Inc	2 MW DFC	Terre Haute, IN	Wabash River Energy, Ltd. Integrated Gasification Combined Cycle (IGCC) Facility	Fourth Quarter 2003	Operational	Natural Gas		www.fce.com
FuelCell Energy	Zoot Enterprises	250kW	Brozeman, MT	Galactic Park High Technology Campus	January 2004	Installed	Natural Gas		
FuelCell Energy	US Coast Guard Research and Development Center		Virginia Beach, VA	Cape Henry Lighthouse	Installed 3/2002	Ongoing Evaluation after 6 months	Methanol and water mixture		US Coast Guard is servicing and maintaining this system Said to use only 16 gallons of fuel / day whereas a generator uses 16 gallons of fuel / hour!
FuelCell Energy	Caterpillar Inc	250kW DFC	Peoria, IL	Caterpillar Techinical Center	December 2003	Operational			For FuelCell Energy: Steve Eschbach, CFA 203-825-6000 seschbach@fce.com

 Created by Fuel Cells 2000, All Rights Reserved

FuelCell Energy	Siemens Westinghouse and BP	250kW	Nikiski, AK	BP's gas-to-liquid test facility	Aug 2001	To be installed 2003	Natural Gas		
FuelCell Energy with Marubeni Corporation	Kirin Brewery	250 kW DFC	Outside Tokyo, Japan	Industrial wastewater facility at Kirin Brewery	January 2003	operational	Digester Gas		
FuelCell Energy with Marubeni Corporation	Marubeni Corporation (FuelCell Energy's Asian Partner)	One 250 kW in 2001, then 4 additional 250 kW or a MW-class plant	New York, NY and Tokyo, Japan						Total contract is for 1.25 MWs and $6.25 million Takeo Nakata: Nakata-t@jp.marubeni.com
FuelCell Energy with Marubeni Corporation	Municipality of Fukuoka, Japan	250 kW DFC	Fukuoka, Japan	Municipal wastewater treatment facility	1st quarter 2003	2-year demo. program	Methane-like digester gas		
FuelCell Energy	State University of New York College of Environmental Science and Forestry (SUNY-ESF), NYSERDA, NYPA	250 kW MCFC CHP	New York, New York	SUNY-ESF	2002	To be installed early 2003	Natural Gas		Waste heat for campus hot water, space heating and/or cooling. Pursued by New York Governor George Pataki. $1 million grant from NYSERDA
FuelCell Energy	PPL Energy Services (FuelCell Energy partner) New Jersey Clean Energy Fund	259 kW MCFC CHP	Toms River, New Jersey	Ocean County College	2003	To be Installed	Natural Gas		
Fuji Electric		Two 100 kW PAFC	Yamagata City, Japan	Sewage Treatment Center	6/2002	Operational	Methane Gas		Fuji Electric has been developing PAFC technology since the 1980s. 50 kW and 100 kW PAFC systems have been commercially available since the late 1990s. They have almost sold 100 units thus far.
Fuji Electric	Tokyo Electric Power Co. (TEPCO)	50 kW	Japan	TEPCO New Energy Park	June 14 1993	Completed Dec. 1996			This unit accumulated 39,291 hours by 10/00.
Global Thermoelectric	Global Thermoelectric	1.35 kW			2000	Completed in June 2000	Natural gas		Operated over 1100 hours
Global Thermoelectric	Global Thermoelectric and Enbridge Inc.	Prototype testing	Enbridge (Canada)		2001	On Going			
Global Thermoelectric	Bonneville Power Administration	Three SOFC systems (2 to 5 kW)	BPA	Field testing sites	2003	To be delivered	Natural gas or porpane		
GM	Prototype testing	75 kW PEMFC	Rochester, NY	GM's new fuel cell research facility	2001	On Going	Natural gas, methanol, gasoline		
GM	DOW Chemical	75kW	Freeport, TX	DOW Chemical site	Feb 2004	Operational for next 4-6 months			DOW Chemical Harold Nicoll 989-636-5162 hgnicoll@dow.com GM Scott Fosgard 586-947-3295 scott.fosgard@gm.com

 Created by Fuel Cells 2000, All Rights Reserved

havePower	H-Power unit	1 EPAC™ back up system	Outside Wilkes Barre, PA	Cellular Comm. Tower	2/21/2002	On Going			World's first cellular communication's tower powered by hydrogen fuel cells.
Hydrogenics, Corp.	Nextel	25 kWHyUPS regen. back-up	Northern CA	Nextel Comm. Trial site	10/2001	9/2003			Target market for this product is the demanding telecommunications industry.
HyRadix Inc	DOE, Propane Education and Research Council, Texas Fuel Cell Partnership		San Antonio, Texas	Texas DOT TransGuide Facility	4/2004	In operation	Propane		First propane fuel cell Technical Contact: Dan Kelly dan.kelly@rrc.state.tx.us Partnership Contact: Ken Zarker kzarker@tceq.state.tx.us
IdaTech	RWE Fuel Cells	2 5kW	Berlin, Germany	Representative office of the State of the North Rhine-Westphalia	4/2004	To be installed	Natural gas		
IdaTech	IdaTech and BPA Alpha unit Testing Buy Down Program Recipient FY1999	5 kW PEM Alpha system	Redmond, OR	Central Electric Co-Operative	Winter 2003	No longer operational			First commercial testing of residential fuel cell systems in NW. 6 were installed at participating utilities for the initial phase of the test (Alpha) fuelcells@bpa.gov Mira Vowles 503.230.4796 mkvowles@bpa.gov
IdaTech	IdaTech and BPA Alpha unit Testing	5 kW PEM Alpha system	Eugene, OR	Emerald Peoples Utility Distribution	Winter 2003	No longer operational			Mira Vowles 503.230.4796 mkvowles@bpa.gov
IdaTech	IdaTech and BPA Alpha unit Testing	5 kW PEM Alpha system	Rotating location	PNGC	Winter 2003	No longer operational			Mira Vowles 503.230.4796 mkvowles@bpa.gov
IdaTech	IdaTech and BPA Alpha unit Testing	5 kW PEM Alpha system	Richmond, WA	Energy Northwest Mobile	Winter 2003	No longer operational			Mira Vowles 503.230.4796 mkvowles@bpa.gov
IdaTech	IdaTech and BPA Alpha unit Testing	5 kW PEM Alpha system	Eureka, MT	Lincoln Electric	Winter 2003	No longer operational			Mira Vowles 503.230.4796 mkvowles@bpa.gov
IdaTech	IdaTech and BPA Alpha unit Testing	5 kW PEM Alpha system	Fergus Electric	Lewiston, MT	Winter 2003	No longer operational			Mira Vowles 503.230.4796 mkvowles@bpa.gov
IdaTech	IdaTech and BPA Beta unit Testing	5 kW PEM Beta system	Various - undisclosed		Winter 2003	No longer operational			Mira Vowles 503.230.4796 mkvowles@bpa.gov fuelcells@bpa.gov
IdaTech	Research & Development division of Electricite de France (EDF)	5 kW PEM system	France	R&D division of (EDF)	2/01	Will end Spring 2002			This field test helps lay the groundwork for IdaTech's commercialization of portable and residential systems.
IdaTech	Portland General Electric through a Bonneville Power Administration program	5 kW PEM system	Portland, Oregon	Portland General Electric Earth Advantage National Center	Jan 2004	Operational			Mira Vowles 503.230.4796 mkvowles@bpa.gov Part of BPA's Northwest demonstration program First fuel cell in Oregon connected to a power grid
Industrial Research Laboratory	Australian Cooperative	6 kW	Perth, Australia	Wind turbine	2003		Hydrogen		The system will link to a wind turbine powering an

 Created by Fuel Cells 2000, All Rights Reserved

(IRL)	Research Center for Renewable Energy								electrolyser to generate the hydrogen. The fuel cell will serve as back up when the wind turbine is not capable of producing power.
Matsushita	Japan Gas Association	PEM CHP residential cogeneration systems	Japan	In-house testing at Japan Gas Assoc.	2001	On going	Natural gas		
Mosaic Energy	NiSource Inc., Ishikawajima-Harima Heavy Industries, and the Gas Technology Institute	5 kW PEMFC	Yokohama, Japan	Retail gasoline service station	July 26, 2001	Testing into 2002	Naphtha		World's first liquid fuel PEMFC test
Mosaic Energy	NiSource Inc., Ishikawajima-Harima Heavy Industries, and the Gas Technology Institute	3 kW PEMFC	Des Plaines, IL				Natural Gas		
Nuvera	RWE Plus AG (Agwill)	5 kW PEMFC of electrical power and 7 kW of heat each	Germany	Apartment buildings throughout	8/02				Part of joint venture between Nuvera and RWE Plus AG to develop and distribute fuel cell systems up to 50 kW (CHP) to Europe Gianfranco.mora@denora.it
Nuvera	MA Technology Collaborative, SatCon Tech. Corp., KeySpan Energy Delivery NE	5 kW telecommunications unit	Massachusetts	Verizon's engineering facility	2001 – 500 hour demonstration	Completed	Natural Gas		US's first fuel cell powered telecommunications site. Mark.a.marchand@verizon.com Derby.r@nuvera.com
Plug Power, Inc.	DOD Residential Fuel Cell Demonstration Program Sierra Army Depot	4.5 kW (1 unit)	Herlong, CA	Barracks	Sept. 2002	Not installed	Propane		H Power was bought out by Plug Power
Plug Power, Inc.	DOD Residential Fuel Cell Demonstration Program Patuxent River NAS	4.5 kW unit	Patuxent River, MD	Office building	Jan. 2004	Operational	Propane		H Power was bought out by Plug Power
Plug Power, Inc.	DOD Residential Fuel Cell Demonstration Program Patuxent River NAS	4.5 kW unit	Patuxent River, MD	Base Housing	Jan. 2004	Operational	Natural gas		H Power was bought out by Plug Power
Plug Power, Inc.	Kamata Inc. (Leading Japan propane distributor)	4.5 kW cogeneration system	Gotenba-city, Japan	Kamata's Gotenba employee facility	May 2002	Installed	Propane		Marks first field test of a propane fueled PEM system for an actual load in the Japanese residential market.
Plug Power, Inc.	Gaz de France	Six 4.5 kW beta cogeneration units	Gaz de France's research and development campus in La Plaine Saint Denis, a suburb of Paris	Gaz de France model home	2001	Being installed	Natural Gas		H Power was bought out by Plug Power
Plug Power, Inc.	Naps Systems Oy (Naps) in Finland, Birka Energi, and ABB	4 kW cogeneration system	Hammarby Sjostad Stockholm, Sweden	Environmental Information Center	June 4, 2002	Installed	H2 produced via PV system combined with an electrolyzer		A second source of hydrogen will be provided from biogas produced at a nearby municipal waste plant

 Created by Fuel Cells 2000, All Rights Reserved

Plug Power, Inc.	Energy Co-Opportunity (ECO) – H Power's marketing partner	50 EPAC™-500 Watt units	Used by various member cooperatives of ECO	Outdoor applications	Ordered 5/2002	Delivered	Direct Hydrogen		Telecom. towers, radio transmitters, signal lights, billboards, emergency back-up for critical circuits
Plug Power, Inc.	Energy Co-Opportunity (ECO)	Four 4.5 kW co-generation residential units			8/2002	Installed			Part of the beta test program with partner Energy Co-Opportunity.
Plug Power, Inc.	Fall River Rural Electrical Cooperative of Ashton, Idaho (member of ECO) and The Propane Education & Research Council	4.5 kW cogen. system	Yellowstone National Park, Wyoming	Ticket kiosks and an office at the West Entrance in West Yellowstone	4/2002	Installed	Propane		H Power was bought out by Plug Power
Plug Power, Inc.	Mitsui & Co., Ltd. (H Power's Asian marketing partner) and Osaka Gas	Eight 500 Watt Beta PEMFC residential cogeneration units	Kansai area of Japan	In-house at Osaka Gas and field locations	Shipped by 2/2003		Natural Gas		Uses Osaka Gas's proprietary steam reforming technology
Plug Power, Inc.	Mitsui & Co., Ltd. (H Power's Asian marketing partner) and Osaka Gas	Alpha PEMFC residential cogeneration units	Kansai area of Japan	In-house at Osaka Gas and field locations	1/2002	Testing moved to Beta units	Natural Gas		Uses Osaka Gas's proprietary steam reforming technology
Plug Power, Inc.	Florida Power and Light Co., DOE	5 kW PEM	North Port, Florida	North Port High School	April 2004	Installed			
Plug Power, Inc.	DOD Residential Fuel Cell Demonstration Program Watervliet Arsenal	5 kW (3 units)	Watervliet, NY	Research Facility	Jan. 2002	Installed	Natural Gas		No cogeneration
Plug Power, Inc.	DOD Residential Fuel Cell Demonstration Program Watervliet Arsenal	5 kW (3 units)	Watervliet, NY	Manufacturing Facility	Jan. 2002	Installed	Natural Gas		No cogeneration
Plug Power, Inc.	DOD Residential Fuel Cell Demonstration Program Watervliet Arsenal	5 kW (4 units)	Watervliet, NY	Officer's Quarters	Jan. 2002	Installed	Natural Gas		No cogeneration
Plug Power, Inc.	DOD Residential Fuel Cell Demonstration Program Fort Gordon		Fort Gordon, GA		March 2004	Installed			
Plug Power, Inc.	Plug Power 125 SU-1 Systems delivered in 2001	5 kW each	Various residential locations		2001		Natural Gas		
Plug Power, Inc.	Long Island Power Authority (LIPA), DOE, NY State Energy Research and Development Authority (NYSERDA)	6 "alpha" 5 kW CHP units	Four Long Island locations	Homes	2000		Natural Gas		By Feb. 2000, a total of 52 systems were installed in the field to provide power to homes and buildings.
Plug Power, Inc.	Long Island Power Authority (LIPA), DOE, NY State Energy Research and Development Authority (NYSERDA)	12 5 kW units		Various NY public facilities	2000				
Plug Power, Inc.	Long Island Power Authority (LIPA), DOE, NY State Energy Research and Development Authority (NYSERDA)	Three 5 kW units	Brookhaven, NY	DOE's Brookhaven National Lab	March 2000				

 Created by Fuel Cells 2000, All Rights Reserved

Plug Power, Inc.	Long Island Power Authority (LIPA), DOE, NY State Energy Research and Development Authority (NYSERDA)	75 PEM systems	West Babylon, NY	LIPA substation	10/2001				The electricity will be distributed to customers through LIPA's electric transmission and distribution system. Expected to produce more than 1 million kWh of electricity during two-year project.
Plug Power, Inc.	Long Island Power Authority (LIPA)	5 kW GenSys™ 5C CHP	Babylon, NY	Town Hall	7/2002	On Going			Produces 5 kW electricity and 9 kW of usable.
Plug Power, Inc.	Long Island Power Authority (LIPA)	Three 5 kW GenSys™ 5C CHP	Farmingdale, NY	SUNY Farmingdale	2003	Operating	Natural Gas		
Plug Power, Inc.	Long Island Power Authority (LIPA)	Three 5 kW GenSys™ 5C CHP	Hempstead, NY	Hofstra University	2002	Operating	Natural Gas		Powering dormitory
Plug Power, Inc.	Long Island Power Authority (LIPA)	One 5 kW GenSys™ 5C CHP	Hempstead, NY	Town of Hempstead Animal Shelter	10/24/03	Operating	Natural Gas		
Plug Power, Inc.	Long Island Power Authority (LIPA)	Two 5 kW GenSys™ 5C CHP	Garden City, NY	Nassau Community College	2003	Operating	Natural Gas		
Plug Power, Inc.	Long Island Power Authority (LIPA)	Two 5 kW GenSys™ 5C CHP	Southampton, NY	Southampton College	2003	Operating	Natural Gas		
Plug Power, Inc.	Long Island Power Authority (LIPA), DOE, NY State Energy Research and Development Authority (NYSERDA) and National Fuel Gas Distribution #1	5 kW, grid-parallel	Lewiston, New York	Single family home	4/02	Oper. for 1 yr.	Natural Gas		The home is one of two residential fuel cell projects in the service area of National Fuel Gas Distribution Corp. Program will be 1 year long, afterwards the unit will be returned to Plug Power for analysis
Plug Power, Inc.	Long Island Power Authority (LIPA), DOE, NY State Energy Research and Development Authority (NYSERDA) and National Fuel Gas Distribution #2	5 kW, grid-parallel	Colden, NY	Single family home	2002	Oper. for 1 yr	Natural Gas		Program will be 1 year long, afterwards the unit will be returned to Plug Power for analysis
Plug Power, Inc.	Plug Power's Demonstration Home		Latham, NY		6/98 - 8/15/99 (H2) 12/15/99 - ?? (Natural Gas)		Hydrogen then, Natural Gas		
Plug Power, Inc.	DTE Energy Technologies	Two 5 kW PEMFC, grid-parallel	Detroit, MI	Detroit Edison's Hancock Station in Commerce Township, MI	6/2002	Installed; one year project	Natural Gas		Support battery systems that provide backup power to the control circuits for the power station's five natural gas fired turbine peaker units.
Plug Power, Inc.	KeySpan Technologies, Inc. and GE MicroGen	30 5 kW	Throughout Long Island and NY metropolitan area				Natural Gas		Agreement made to purchase and test 30 Plug Power residential units throughout Long Island and NY metropolitan area
Plug Power, Inc.	Flint Energies and GE Fuel Cell Systems	5 kW PEMFC	Warner Robins, GA	Flint Energies' service center facility	7/2002	On Going	Natural Gas		
Plug Power, Inc.	ISH Fair, German Gas Association, German Technical Surveillance Organization	One Fuel Cell Heating Appliance (FCHA)	Frankfurt, Germany	ISH Fair exhibition area	March 2001	Completed	Natural Gas		First FCHA demonstrated.
Plug Power, Inc.	German Gas	One CE-	Gelsenkirchen,	Multiple	12/20	On Going			It supplies seven families

 Created by Fuel Cells 2000, All Rights Reserved

	Association, German Technical Surveillance Organization	Certified Fuel Cell Heating Appliance (FCHA)	Germany	family home	01				with electricity, room heat, and hot water. Provides 80% of the home's electricity and nearly all of the hot water and room heating requirements.
Plug Power, Inc.	German Gas Association, German Technical Surveillance Organization,	One CE-Certified Fuel Cell Heating Appliance (FCHA)	Essen, Germany	Multiple family home	2001	On Going			Part of a demonstration program funded by the German State of North-Rhine Westphalia and supported by E.ON, Ruhrgas and several local utilities.
Plug Power, Inc.	German Gas Association, German Technical Surveillance Organization	One CE-Certified Fuel Cell Heating Appliance (FCHA)	Dusseldorf, Germany	Microbrewery	2001	On Going			Part of a demonstration program funded by the German State of North-Rhine Westphalia and supported by E.ON, Ruhrgas and several local utilities.
Plug Power, Inc.	Miller Burton Homes, Built Green CO, City and County of Denver, Govenor's OEMC, IREA, Plug Power, Xcel Energy	5 kW CHP residential unit	Denver, CO	Miller Burton Homes' Roaring Fork Parade Home	2002	Parade of Homes: Aug. 31 to Oct. 6 2002	Natural Gas		After the Parade of Homes, this unit will be stationed at the City and County of Denver's fire station at Washington Park, where is will provide a sign. Part of the facility's power and some domestic hot water
Plug Power, Inc.	Governor's Office of Energy Management and Conservation (OEMC), Plug power, Xcel Energy, & City and County of Denver	5 kW CHP residential unit	Denver, CO	Washington Park Fire Station	12/2002	Dec. 2002 – Dec. 2003	Natural Gas		This is the same unit displayed in the Parade of Homes. This demonstration will last one year. This unit provides a portion of the facilities' electricity and heat.
Plug Power, Inc.	Plug Power Long Island Power Authority (LIPA)	Three 5 kW Back up UPS system	Kings Point, New York	US Merchant Marine Academy	To be installed Fall 2002/3		Hydrogen		The new system marks Plug Power's first shipment into the backup/UPS markets. LIPA will install the units.
Plug Power, Inc.		9 5 kW GenSys™ 5C CHP PEMFCs	Naval facilities in California	See Comments	9/2002	On Going	Natural Gas		8 will power & heat bachelor-enlisted quarters, a gym, and laundry facility at the Naval Air Station North Island and the Submarine Base located in San Diego, Ca. The ninth system will power & heat an indoor pool at the Naval Air Weapons Station in China Lake, Ca. Represents the first Plug Power systems installed and operated in California
Plug Power, Inc.	Bonneville Power Adminsitration Northwest Natural Inc.	5 kW GenSys CHP System	Hillsboro, OR	Harkins House Juvenile Detention Facility	Nov 2003	Installed			Mira Vowles 503.230.4796 mkvowles@bpa.gov
ReliOn (formerly Avista Labs)	Avista Labs and US Army Corps of Engineers Buy Down Program	3 kW PEMFC (SR-72)	Washington Airport at Geiger Field in Spokane, WA	Guard facility	March 2002	Demo. Compl.	Industrial Grade bottled Hydrogen		
ReliOn	DOD Residential Fuel Cell Demonstration Program MCB Kaneohe Bay	5 kW (1 unit)	Kaneohe Bay, HI	TBA	Dec. 2002	Not installed	Propane		No cogeneration
ReliOn	DOD Residential Fuel Cell Demonstration Program McChord AFB	6 500 W units	McChord AFB, WA	FAA Radio Transmitter	April 2003	Installed			

 Created by Fuel Cells 2000, All Rights Reserved

ReliOn	DOD Residential Fuel Cell Demonstration Program Ft. Jackson	5 kW (1 unit)	Columbia, NC	Base Housing	Dec. 2002	Not installed	Natural gas		No cogeneration
ReliOn	DOD Residential Fuel Cell Demonstration Program Barksdale AFB	5 kW (1 Unit)	Bossier City, LA	Base Housing	Dec. 2002	Not installed	Natural gas		No cogeneration
ReliOn	FCTEC http://www.fctec.com/main.html (DOD)	720 W PEM Avista Fuel Cell	Johnstown, PA	FCTEC					Test Program
ReliOn	Bonneville Power Administration	1 kW		Central Washington University	January 2004	Commissioned			
Siemens Westinghouse	Siemens and Edison SpA	300 kW pressurized system (PH) SOFC CHP	Milan, Italy (Sinetta Marengo)	Edison SpA – research facility	Scheduled for 9/02		PNG		Cell length = 1500 mm / 1728 cells/stack
Siemens Westinghouse	EPA at Fort Meade	1 MW pressurized (PH) Hybrid SOFC system	Fort Meade: Just outside Washington, DC	Fort Meade EPA Lab	2003		Natural Gas		Cinergy, with headquarters in Cincinnati, Ohio, will be the operator of this demonstration. Cell length = 1500 mm / 5760 cells/stack
Siemens Westinghouse	RWE	300 kW SOFC/gas turbine pressurized (PH) hybrid CHP system	Essen, Germany	RWE Energie Meteorit Exposition	Scheduled for 4/02	In Development	Natural Gas		Zero SOx, and less than 1 ppm NOx emissions expected Cell length = 1500 mm / 1728 cells/stack Expected electrical efficiency = 58%
Siemens Westinghouse	Stadtwerke Hanover AG and E.ON Energie AG	250 kW SOFC	Hanover, Germany	Herrenhausen power plant	2003				
Siemens Westinghouse	CO2 capture demonstration with Shell	250 kW SOFC hybrid system	Norway		2003	In Development	Natural Gas		This unit is being fabricated for Shell in Norway to demonstrate the principle of CO2 capture from power plants. By keeping the fuel and air streams separate, the CO2 generated can be captured, and the SOFC power system will essentially have clean water as its only effluent Cell length = 1500 mm / 2304 cells/stack
Siemens Westinghouse	Pre-commercialization with EDB/ELSAM	Siemens Westinghouse 125 kW SOFC/GT hybrid co-generation system	Westervoort, Netherlands (near Arnhem)	EDB/ELSAM – a consortium of Dutch and Danish utilities / power to the local grid	Dec. 1997		Natural Gas		It is believed to be the highest sustained efficiency of any simple fuel cell system operating on natural gas. It also contributed 64 kW of heat into the district's hot water system. Put out average of 63 kW thermal output as hot water into the districts hot water system. Output of negligible NOx and SOx emissions. 1 stack; 1500 mm long; 1152 cells per stack
Siemens Westinghouse	At EDB/ELSAM, a consortium of Dutch and Danish utilities	Siemens Westinghouse 125 kW SOFC/GT hybrid co-	Westervoort, Netherlands		Dec. 1999	Unit Moved to RWE (below)	PNG		

 Created by Fuel Cells 2000, All Rights Reserved

		generation system						This system typically supplies 109 kW electrical power and 63 kW thermal output as hot water. As of November 2000, this system had operated for over 16,000 hours achieving 46% electrical eff. at 109 kW net AC power. Operated over 12,577 hours	
Siemens Westinghouse	RWE	Siemens Westinghouse 100 kW SOFC co-generation system	Germany	RWE	2001	Still in Testing (moved from EDB/ELSAM)	PNG		1 stack; 1500 mm long; 1152 cells per stack Operated over 4000+ hours
Siemens Westinghouse	EC and DOE	1 MW pressurized (PH) hybrid SOFC system,	Marbach, Germany	Energie Baden-Wurttemberg (EnBW)'s site	November, 2003		PNG		A consortium of European utilities led by ENERGIE will be the Program Manager. This will be the largest fuel cell CHP demonstration in Europe. Cell length = 1500 mm / 5760 cells/stack
Siemens Westinghouse	JGU-1	20 kW SOFC/GT hybrid system			1992	Finished	PNG (Pipe line Natural Gas)		2 stacks, 500 mm long, 576 cell per stack Logged 817 hours
Siemens Westinghouse	JGU-2	25 kW SOFC/GT hybrid			1995	Finished	PNG		1 stack; 500 mm long; 576 cells per stack Logged 13294 hours
Siemens Westinghouse	OPT	250 kW SOFC/GT hybrid system			2002	Planned	PNG		Cell length = 1500 mm / 2304 cells/stack
Siemens Westinghouse	Osaka Gas	3 kW SOFC/GT hybrid			1987	Finished	H2+CO		1 stack 360 mm long with 144 cells Logged 3012 hours
Siemens Westinghouse	South California Edison PSOFC / MTG	180 kW PSOFC/GT hybrid system			2000	Finished	Natural Gas		1 stack; 1500 mm long; 1152 cells per stack Logged 770 hours
Siemens Westinghouse	South California Edison	20 kWe SOFC/GT hybrid system			1994	Finished	Natural Gas		1 stack; 500 mm long; 576 cells per stack Logged 6015 hours
Siemens Westinghouse	South California Edison	27 kW SOFC/GT hybrid system			1995	Finished	Natural Gas; Diesel; Jet fuel		1 stack; 500 mm long; 576 cells per stack Logged 5582 hours
Siemens Westinghouse	Tokyo Gas	3 kW SOFC/GT hybrid system			1987	Finished	H2+CO		1 stack 360 mm long with 144 cells Logged 4882 hours
Siemens Westinghouse	TVA	0.4 kW SOFC/Gas Turbine hybrid power systems			1986	Finished	H2+CO		1 stack 300 mm long with 24 cells Logged 1760 hours
Siemens Westinghouse	Utilities-A	20 kW SOFC/GT hybrid system			1992	Finished	PNG		1 stacks; 500 mm long; 576 cells per stack Logged 2601 hours
Siemens Westinghouse	Utilities-B1	20 kW SOFC/GT hybrid system			1992	Finished	PNG		1 stack; 500 mm long; 576 cells per stack Logged 1579 hours

 Created by Fuel Cells 2000, All Rights Reserved

Siemens Westinghouse	Utilities-B2	20 kW SOFC/GT hybrid system			1993	Finished	PNG		1 stack; 500 mm long; 576 cells per stack Logged 7064 hours
Siemens Westinghouse	NFCRC under contract w/ Edison International and Siemens Westinghouse Power Corp. w/ funding from DOE and Ca Energy Commission	220 kW SOFC w/ micro-turbine generator hybrid	University of California (Irvine, CA)	NFCRC		Has started its test period, scheduled for 3000 hours	Natural Gas		World's first Fuel Cell-Gas micro-Turbine Hybrid. The micro-turbine is driven by the hot pressurized exhaust produced by the fuel cells. Set a new efficiency record for a fuel cell system operating on natural gas.
Siemens Westinghouse	Prototype Demonstrations with BP America, Inc. Buy Down Program Recipient FY2000	250 kW SOFC CHP co-generation system	Nikiski, Alaska	Gas-to-liquids plant	2003		Natural Gas		
Siemens Westinghouse	Prototype Demonstrations with Kinectrics Buy Down Program Recipient FY1999	250 kW SOFC atomospheric pressure system (ATM)	Toronto, Canada	Kenectrics (formerly Ontario Hydro)	Mid-2002				Next step in Siemen's Commercialization plan is to demonstrate prototypes of the first commercial products in 2001-2004
Stuart Energy Systems	South Coast Air Quality Management District	120kW	Diamond Bar, CA	AQMD headquarters	Nov 2003	To be delivered early 2004	Hydrogen		www.stuartenergy.com
Sulzer Hexis	E.ON Energie AG, München	1 kW HXS 1000 PREMIERE					Natural Gas		www.eon-energie.de One of Europe's largest private electricity, gas and water utilities purchase a total of 55 «HXS 1000 PREMIERE» over the period 2002 -03.
Sulzer Hexis	EnBW Energie Baden-Württemberg AG, Karlsruhe	1 kW HXS 1000 PREMIERE					Natural Gas		www.enbw.de One of the largest German supraregional utilities will purchase a total of 40 systems «HXS 1000 PREMIERE» over the period 2001 – 03.
Sulzer Hexis	EWE PLC, Oldenburg	1 kW HXS 1000 PREMIERE					Natural Gas		www.ewe.de The largest regional utility in Germany will purchase a total of 155 Hexis fuel cells systems «HXS 1000 PREMIERE» over the period 2001 – 03.
Sulzer Hexis	EWR Elektrizitätswerk Rheinhessen AG, Worms	1 kW HXS 1000 PREMIERE					Natural Gas		www.ewr.de The utility for the region Rheinhessen/Ried will purchase a total of 60 «HXS 1000 PREMIERE» over the period 2001 – 03.
Sulzer Hexis	Thyssengas GmbH, Duisburg	1 kW HXS 1000 PREMIERE					Natural Gas		www.thyssengas.de One of the important natural gas importer and supplier will purchase a total of 42 «HXS 1000 PREMIERE» over the period 2002 -03.
Sulzer Hexis	VNG - Verbundgasnetz AG, Leipzig	1 kW HXS 1000 PREMIERE					Natural Gas		www.vng.de The East German utility for gas piped over a long distance purchase a total of 16 «HXS 1000 PREMIERE» over the period 2002 -03.
Sulzer Hexis	GVM	30 residential systems	Throughout Germany, Austria, and Switzerland	Various GVM customer homes	Manufact. Of all systems	Manufacturing	Natural Gas		This part of Sulzer's agreement to place 400 pre-series FC systems. Sulzer delivered 58

 Created by Fuel Cells 2000, All Rights Reserved

					completed by end of 2003				systems in 2002
Tennessee Valley Authority			Columbus, Mississippi		Nov 2001	Begin operation in 2003			
Teledyne (formerly Energy Partners)	DOE	3 kW fuel cell distributed generator			2001	Completed Fall 2001	Natural Gas		Field testing of residential natural gas systems started in 2001
Teledyne (formerly Energy Partners)	DOE	7 kW distributed generator			2002	To be released to DOE in Fall 2002			Successor unit of the 3 kW
UTC Fuel Cells	EPA in Ann Arbor, MI, Noresco	PC25 200 kW PAFC	Ann Arbor, MI	EPA building	January 2004	Operational	Natural Gas	Grid Parallel setup. Manufactured in 1996, this unit had numerous upgrades installed prior to its installation here. It has been limited to 175Kw output due to overheating internally. UTC believes the new stack and heat exchangers will allow the output to increase to 200Kw. Apparently, a leaking heat exchanger caused the premature failure of one of the stacks.	
UTC Fuel Cells	FCTEC http://www.fctec.com/main.html (DOD)	PC25C 200 kW PAFC	Johnstown, PA	FCTEC	January 1999	On going until 1/2003	Natural Gas		
UTC Fuel Cells	PAFC Demonstration Program (DOD) Fort Bliss	Model PC25C Grid connected at new transformer	El Paso,TX	Laundry	Sep.-1997	Operational	Natural Gas		Thermal output heats laundry hot water storage tanks Total estimated thermal utilization ~17%
UTC Fuel Cells	PAFC Demonstration Program (DOD) Fort Eustis	Model PC25B	Newport News, VA	Gymnasium/ Pool	1/2004	Project Completed Successfully	Natural Gas		Thermal output to DHW and pool (~68% est. thermal utilization)
UTC Fuel Cells	UTC and TBE GmbH with GEW Koln AG	UTC PAFC 220 kW	Cologne, Germany	Waste treatment plant			Digester Gas		The first time in Europe a fuel cell was used to utilize waste methanol produced from sewage to generate electricity and heat efficiency. Heat generated will be used in the sewage treatment process. This supplements 4 other systems operated by UTC/ONSI at waste water treatment plants in USA, 3 in Japan, and systems at nearly 200 other locations worldwide

 Created by Fuel Cells 2000, All Rights Reserved

UTC Fuel Cells	First National Bank of Omaha and Sure Power Corp.	Four PC25 200 kW systems	Omaha, NE	National Bank	Nov. 1999	On Going (purchase)	Natural Gas		
UTC Fuel Cells	Hospital in Staten Island, NY	200 kW PAFC	Staten Island, NY	Hospital			Natural Gas		
UTC Fuel Cells	Hotel in Spokane, WA	200 kW PAFC	Spokane, WA	Hotel			Natural Gas		
UTC Fuel Cells	Las Virgenes Municipal Water District (AGD) in Calabasas, CA	200 kW PAFC	Calabasas, CA						
UTC Fuel Cells	PAFC Demonstration Program (DOD) Fort Huachuca	Model PC25C Grid connected at existing electrical transformer (no emergency back-up)	Sierra Vista, AZ	Riley Barracks	Jul.-1997	Operational	Natural Gas		High grade thermal output (option) to space heating loop Thermal output to domestic hot water (total ~44% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Fort Richardson	Model PC25C Grid connected at existing electrical panel (no emergency back-up)	Anchorage, AK	National Guard Armory	Apr.-1997	Off-line, Apr-2001	Natural Gas		High grade thermal output (option) to space heating loop Thermal output to domestic hot water (total ~45% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) U.S. Army Soldier Systems Center	Model PC25B Grid connected at existing sub panel	Natick, MA	Boiler Plant	Feb.-1995	Operational	Natural Gas		Thermal output to storage tank (~45% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Picatinny Arsenal	Model PC25B Grid connected at panel inside electric room	Dover, NJ	Boiler Plant	Oct.-1995	Shut down, Jul-2001	Natural Gas		Thermal output preheats make-up water (~100% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Pine Bluff Arsenal	Model PC25B Grid connected at splice after pole mounted transformer Grid independent terminals power the boiler plant.	White Hall, AR	Boiler Plant	Oct.-1997	Shut down, Jan-2000	Natural Gas		Thermal output heats boiler make-up water Total estimated thermal utilization ~90%
UTC Fuel Cells	PAFC Demonstration Program (DOD) US Military Academy	Model PC25B Grid connected at existing panel	West Point, NY	Central Boiler Plant	Dec.-1995	Decommissioned, Feb-2001	Natural Gas		Thermal output for boiler make-up water (~70% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Watervliet Arsenal	Model PC25B Grid connected at existing electrical panel	Albany, NY	Central Boiler Plant	Oct.-1997	Operational	Natural Gas		Thermal output to preheat boiler make-up (~58% est. thermal utilization)

 Created by Fuel Cells 2000, All Rights Reserved

		Emergency back-up for grid-independent operation							
UTC Fuel Cells	PAFC Demonstration Program (DOD) 911th Airlift Wing Consolidated Natural Gas	Model PC25C Grid connected (no emergency back-up)	Pittsburgh, PA	Central Heating Plant	Feb.-1997	Off-line, Sep-2001	Natural Gas		
UTC Fuel Cells	US Airways, Peoples' Natural Gas	Model PC25C 200 kW	Pittsburgh, PA	U.S. Air's hanger #2 @ Pittsburgh International Airport			Natural Gas		
UTC Fuel Cells	PAFC Demonstration Program (DOD) 934th Airlift Wing	Model PC25B Grid connected at new electrical transformer (fuel cell option)	Minneapolis, MN	Boiler Plant	Feb.-1995	Off-line, Sep-2000	Natural Gas		Thermal output to preheat boiler make-up water (~45% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Barksdale AFB	Model PC25C Grid connected at panel in electrical room	Bossier City, LA	Hospital	Jul.-1997	Operational	Natural Gas		Thermal output heats hydronic space heat/reheat loop Total estimated thermal utilization ~90%
UTC Fuel Cells	PAFC Demonstration Program (DOD) Davis-Monthan AFB	Model PC25C Grid connected at new transformer (Program option)	Tucson, AZ	Gymnasium	Dec.-1997	Operational	Natural Gas		High grade thermal output (Program option) to absorption chillers Low grade thermal output to hot water storage tank Total estimated thermal utilization ~65%
UTC Fuel Cells	PAFC Demonstration Program (DOD) Edwards AFB	Model PC25C Grid connected at existing transformer	Palmdale, CA	Hospital	Jul.-1997	Operational	Natural Gas		High grade thermal output (Program option) to space heating loop Total estimated thermal utilization ~23%
UTC Fuel Cells	PAFC Demonstration Program (DOD) Kirtland AFB	Model PC25B Grid connected at switch tied to electrical transformer Grid independent connection to entire boiler plant	Albuquerque, NM	Boiler Plant	Sep.-1995	Decommissioned, Dec.-2001	Natural Gas		Thermal output to deaerator tank (~55% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Laughlin AFB	Model PC25C Grid connected at existing electrical transformer (no emergency back-up)	Del Rio, TX	Hospital	Sep.-1997	Operational	Natural Gas		Thermal output to space heat/cool reheat loop and DHW loop (-75% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Little Rock AFB	Model PC25C Grid connected at electrical panel	Jacksonville, AR	Hospital	Oct.-1997	Shut down, Dec.-2000	Natural Gas		Thermal output heats space conditioning recirculation loop Total estimated thermal utilization ~85% Currently waiting transfer to another DOD facility

 Created by Fuel Cells 2000, All Rights Reserved

UTC Fuel Cells	PAFC Demonstration Program (DOD) Nellis AFB	Model PC25B Grid connected at main breaker panel	Las Vegas, NV	Central Plant for Dorm Facility	Oct.-1995	Off-line, Jun-2001	Natural Gas		Thermal to make-up water and heat pump loop (~40% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Vandenberg AFB	Model PC25A	Lompoc, CA	Space Control Center	March 25, 1994	Decommissioned, Feb-2001	Natural Gas		The power plant was moved to Pinal Air Park, Arizona Air National Guard in Tucson, Arizona and began operation on March 26, 2001. It is now operating at 175 kW to facilitate long-term operation of the power plant.
UTC Fuel Cells	PAFC Demonstration Program (DOD) Westover ARB	Model PC25C Grid connected at new electrical transformer (Program option)	Chicopee, MA	Boiler Plant	Sep.-1997	Operational	Natural Gas		Low grade thermal output heats boiler make-up water High grade thermal output (Program option) to condensate return loop Total estimated thermal utilization ~45% est.
UTC Fuel Cells	PAFC Demonstration Program (DOD) CBC Port Hueneme	Model PC25B Grid connected at new transformer	Port Hueneme, CA	Swimming Pool	Aug.-1997	Off-line, Dec-2001	Natural Gas		Thermal output heats swimming pool Total estimated thermal utilization ~92%
UTC Fuel Cells	PAFC Demonstration Program (DOD) Naval Hospital MCB Camp Pendleton	Model PC25B Grid connected at existing panel	Oceanside, CA	Naval Hospital	Oct.-1995	Decommissioned - Jan. 2002	Natural Gas		Thermal output for DHW storage (~75% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) NAS Fallon	Model PC25C Grid connected at new electric transformer (fuel cell option) Grid independent connection at new electric transformer (fuel cell option)	Fallon, NV	Galley	Mar.-1997	Operational	Natural Gas		Thermal output to DHW loop (~10% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Naval Hospital NAS Jacksonville Logan Energy	Model PC25C Grid connected at existing electrical panel (no emergency back-up)	Jacksonville, FL	Naval Hospital	Apr.-1997	On Going	Natural Gas		Thermal output to DHW loop (~56% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Naval Station Newport	Model PC25PC25B Grid connected at boiler plant electrical transformer	Newport, RI	Boiler Plant	Feb.-1995	Shut down, Apr-2001	Natural Gas		Thermal output to preheat boiler make-up water (~60% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) Naval Oceanographic Office	Model PC25B Grid connected at electrical panel Grid	Stennis Space Center, MS	Naval Oceanic Center for NAVO support	Sep.-1997	Operational	Natural Gas		Thermal output used for space heat/reheat loop Total estimated thermal utilization ~12%

 Created by Fuel Cells 2000, All Rights Reserved

		independent load connected at new panel							
UTC Fuel Cells	PAFC Demonstration Program (DOD) Subase New London	Model PC25C Grid connected at existing electrical panel	Groton, CT	Boiler Plant	Oct.-1997	Operational	Natural Gas		Thermal output heats boiler make-up water Total estimated thermal utilization ~90%
UTC Fuel Cells	PAFC Demonstration Program (DOD) Naval Hospital MCAGCC Twenty-nine Palms	Model PC25B Grid connected at existing sub panel Grid independent connection at new electrical sub panel	Twenty-nine Palms, CA	Naval Hospital	Jun.-1996	Decommissioned, May-2000	Natural Gas		Thermal output to DHW loops (~60% est. thermal utilization)
UTC Fuel Cells	PAFC Demonstration Program (DOD) US Naval Academy	Model PC25C Grid connected in electrical room	Annapolis, MD	Galley	Sep.-1997	Operational	Natural Gas		Thermal output heats make-up water Total estimated thermal utilization ~78%
UTC Fuel Cells	PAFC Demonstration Program (DOD) National Defense Center for Environmental Excellence (NDCEE)	Model PC25C Grid connected in spare panel slot	Johnstown, PA	Industrial Building	Aug.-1997	Operational	Natural Gas		High grade thermal output heats evaporator tank Total estimated thermal utilization ~19%
UTC Fuel Cells	Australian Technology Park Sydney LTD Buy Down Program Recipient FY1998	200 kW PAFC	Sydney, Australia	Technology Park	FY1998		Natural Gas		Australia's First fuel vell
UTC Fuel Cells	Toshiba, Institute of Energy Economics of Japan, New Energy and Industrial Technology Development Organizations (NEDO) of Japan	200 kW PC25™	Guangzhou (Canton) City, China	Hog farm	Late 2001	On going	Liquefied petroleum gas (LPG) and then waste methane gas produced at farm		First commercial fuel cell power installation in China. Sold to Toshiba Corp. which was modified and sold to the customer. The unit is managed by the Industrial Technology Development Organization (NEDO) of Japan. At this point (1/9/02), UTC has delivered more than 225 fuel cells to customers in 19 countries on five continents.
UTC Fuel Cells	AEC South County Hospital	200 kW PAFC		Hospital	FY1998		Natural Gas		
UTC Fuel Cells	South County Hospital	200 kW PAFC	Wakefield, RI	South County Hospital			Natural Gas		
UTC Fuel Cells	Alcorn State University Logan Energy	200 kW PAFC	Alcorn, Mississippi	Supporting Alcorn State University's campus grid	9/2000	On Going	Natural Gas		
UTC Fuel Cells	Assured Power	UTC PC25 200 kW system					Natural Gas		
UTC Fuel Cells		200 kW	Braintree, MA		FY19				

 Created by Fuel Cells 2000, All Rights Reserved

	Braintree Electric light Department	PAFC			95				
UTC Fuel Cells	Brooklyn Union Gas Co.	200 kW PAFC	Brooklyn, NY	Saint Vincent's Hospital Laundry facility	(Pre-Commercial) Oct. 1992	On Going	Natural Gas		1995 Cogeneration Project of the Year by the Cogeneration and Competitive Power Institute
UTC Fuel Cells	Chevron	200 kW PAFC			FY2000				
UTC Fuel Cells	Chugach Electric Association Buy Down Recipient FY1998	Five 200 kW PAFC systems	Anchorage, Alaska	US Postal Service headquarters	2000	On Going	Natural Gas	 In 2000, it was the largest commercial fuel cell system in the nation, comprising of 5 UTC PC25 systems. It is also the first time a fuel cell system is part of an electric utility's grid	
UTC Fuel Cells	City of Mesa Utilities Department Buy Down Program Recipient FY1995	200 kW PAFC							
UTC Fuel Cells	City of Portland, OR Buy Down Recipient FY1996-1997	200 kW PAFC system	Portland, OR	Columbia Blvd. Waste Water Treatment Plant (ADG)	May 1999		Digester Gas		
UTC Fuel Cells	CLC S.r.l. Italy Ansaldo/Energie und Wasserversorgung AG Buy Down Recipient FY1995	200 kW PAFC			Installed 1996/7		Natural Gas		Ansaldo (ARI) is also the exclusive dealer of UTC Fuel Cells) for Italy, France and Spain (non-exclusive for the rest of Europe) for the PC25C fuel cell powerplant. Ansaldo's next unit was converted to run on liquid hydrogen and was placed next to the original Natural Gas fed one as a 2 year demonstration. http://www.ansaldoricerche.it/clc/ari.htm
UTC Fuel Cells	CLC S.r.l. Italy Ansaldo / Sun Chemical Buy Down Recipient FY1995	Four 200 kW PAFC systems		Sun Chemical			Natural Gas		
UTC Fuel Cells	CLC S.r.l. Italy Ansaldo/Vattenfall AB Buy Down Recipient FY1995	200 kW PAFC		Vattenfall AB			Natural Gas		
UTC Fuel Cells	CLC Srl Italy Ansaldo/Stadtwerke Oranienburg	200 kW PAFC		Stadtwerke Oranienburg			Natural Gas		

 Created by Fuel Cells 2000, All Rights Reserved

	Buy Down Recipient FY1995								
UTC Fuel Cells	CLC Srl Piazza Carignano 2 Bu Down Recipient FY1995	200 kW PAFC					Natural Gas		
UTC Fuel Cells	CLC.r.l. Italy Ansaldo/Gasversorgung Sachen Anhalt Gmbh Buy Down Recipient FY1995	200 kW PAFC					Natural Gas		
UTC Fuel Cells	CLC.r.l. Italy Ansaldo/Stadtwerke Saarbrucken AG Buy Down Recipient FY1995	200 kW PAFC		Stadtwerke Saarbrucken AG			Natural Gas		
UTC Fuel Cells	Connecticut Juvenile School Buy Down Recipient FY1996-1997	Six 200 kW PAFC systems (1.2 MW)	Middletown, Connecticut	Juvenile Training School	2001	On Going	Natural Gas	These are used in conjunction with traditional generators and the national grid to provide power, heating and cooling to the facility.	
UTC Fuel Cells	Connecticut Natural Gas Corp. Bu Down Recipient FY1995	200 kW PAFC	Connecticut	Natural Gas Corp.			Natural Gas		
UTC Fuel Cells	CTG Corporation Buy Down Recipient FY1996-1997	Two 200 kW PAFC systems	Uncasville, Connecticut	Mohegan Sun Casino Hotel		On Going	Natural Gas		
UTC Fuel Cells	Durst Corporation Buy Down Recipient FY1996-1997	Two 200 kW PAFC systems	4Times Square, New York	4th floor Conde Nast Building		On going	Natural Gas		Provides power for the NASDAQ sign
UTC Fuel Cells	Energy 2000 Buy Down Recipient FY1996-1997	Two 200 kW PAFC systems		Las Virgines Wastewater Treatment			Digester Gas		
UTC Fuel Cells	Equitable Resources Buy Down Recipient FY1995	200 kW PAFC							Equitable Resources installed 10 PC25s at US Facilities of DOD in 1997
UTC Fuel Cells	Equitable Resources Bu Down Recipient FY1995	200 kW PAFC							
UTC Fuel Cells	Equitable Resources	200 kW PAFC							

 Created by Fuel Cells 2000, All Rights Reserved

	Buy Down Recipient FY1995								
UTC Fuel Cells	Equitable Resources Buy Down Recipient FY1995	200 kW PAFC							
UTC Fuel Cells	Equitable Resources Buy Down Recipient FY1995	200 kW PAFC	Oakmont, PA	Presbyterian Medical Center			Natural Gas		
UTC Fuel Cells	Equitable Resources, NORESCO Buy Down Recipient FY1995	200 kW PAFC							
UTC Fuel Cells	Gas, Elektrizitats und Wasserwerk Buy Down Recipient FY1998	200 kW PAFC							
UTC Fuel Cells	Hamilton Sundstrand Buy Down Recipient FY1995	200 kW PAFC	Windsor Locks, CT	Hamilton Sundstrand Data Center			Natural Gas		
UTC Fuel Cells	HGC Hamburg Gas Consult Buy Down Recipient FY1998	200 kW PAFC	Hamburg, Germany		Installed	On Going			
UTC Fuel Cells	Logan Energy Rebekah Baines Johnson Health Center Buy Down Recipient FY1996-1997	200 kW PC25	Austin, Texas	Rebekah Baines Johnson Health Center	7/2002 installed	On Going	Natural Gas		Electricity is fed into the Austin Energy electric grid, making it the 1st fuel cell in Texas to feed power to the grid. The health center is using the 900,000 BTUs of thermal energy to heat their water. Austin Energy plans to provide tours and educational programs
UTC Fuel Cells	Logan Energy Buy Down Recipient FY1996-1997	200 kW PAFC	Irvine, CA	Ford Motor Co.'s North American Premier Automotive Group HQ	2001	On going	Natural Gas		
UTC Fuel Cells	Logan Energy Buy Down Recipient FY1996-1997	200 kW PAFC		Merck Co.					
UTC Fuel Cells	Logan Energy Buy Down Recipient FY1996-1997	200 kW PAFC	Bellarie (Houston), TX	ChevronTexaco Company	5/2000				
UTC Fuel Cells	Logan Energy Buy Down Recipient FY1996-1997	200 kW PAFC	Harvey, Louisiana	Citizens Utilities' operations center		Decommissioned	Natural Gas	Project decommissioned after customer relocated. Power plant is available for sale or lease to new customer site ($400,000). See Logan Energy: http://www.loganenergy.com/commercial/saleorlease.ht	

 Created by Fuel Cells 2000, All Rights Reserved

								ml	
UTC Fuel Cells	Lord & Company Buy Down Recipient FY1998	Two 200 kW PAFC systems							
UTC Fuel Cells	Lord & Company Buy Down Recipient again FY1998	200 kW PAFC							
UTC Fuel Cells	Los Angeles Department of Water and Power Buy Down recipient FY2000	200 kW PAFC	Near downtown LA on Main Street	LADWP Main Street Service Testing Facility	July 2003	Moved to Storage	Natural Gas		
UTC Fuel Cells	McBride Energy Buy Down recipient FY1998	Two 200 kW PAFC	New Jersey	Ramapo College of New Jersey			Natural Gas		
UTC Fuel Cells	NASA		Space		1958				Since 1966, all of the more than 100 U.S. manned space flights, including the Space Shuttle, have operated with fuel cells supplied by UTC companies. Between their first flight in 1981 and their 71st flight in 1995, the UTC Fuel Cells power plants aboard the Space Shuttle vehicles accumulated a total of 50,000 hours of mission time in 1995
UTC Fuel Cells	National Rural Electric Cooperative Buy Down Recipient FY1995	200 kW PAFC							
UTC Fuel Cells	New England Power Buy Down Recipient FY1995	200 kW PAFC							
UTC Fuel Cells	Co-funded by KeySpan Corp. and DOE	Two 200 kW PC25 Model C systems	Staten Island, NY	Sun Chemical Corp.	mid-1996	Operational	Natural Gas		These units have operated over 40,000 hours (US record) First Model C's installed in North America
UTC Fuel Cells	New York Power Authority with KeySpan	PC25 200 kW	Coney Island, NY	20% of New York Aquarium's power needs	Sept. 2001	Operational	Natural Gas	 Keyspan is an authorized service provider for nine PC25 natural gas fueled fuel cells in the New York area (6/02) Grid Parallel	
UTC Fuel Cells	NYPA, KeySpan, and Central Park Police Precinct	200 kW	Manhattan, NY	Central Park HQs	April 1999	On going	Natural Gas		Independent of the electric gird
UTC Fuel Cells	NYPA, KepSpan, And North Central Bronx Hospital (NCBH)	200 kW	Bronx, NY	North Central Hospital	Oct. 2000	On going	Natural Gas		Supplies supplemental power and back-up power
UTC Fuel Cells	NYPA, KeySpan With Westchester	200 kW	Yonkers, NY	Wastewater treatment plant	April 1997	On going	Anaerobic digester gas from		Supplies supplemental power Grid Parallel

 Created by Fuel Cells 2000, All Rights Reserved

	County Wastewater Treatment Plant in Yonkers, NY						the waste water treatment process		World's First ADG fueled fuel cell
UTC Fuel Cells	NYPA, DEP	2 200kW	Brooklyn, NY	Ward 26 Wastewater Treatment Plant	Feb 2004	Installed			Uses fuel cells to convert waste gas into energy to power the facility
UTC Fuel Cells	NYPA and NYSERDA	3 PC25 200 kW	Coster Street and Ryawa Ave, Bronx, NY 10474	Hunts Point waste water treatment plant	2004	On Going	Digester Gas		Grid Parallel
UTC Fuel Cells	NYPA and NYSERDA	2 PC25 200 kW	63 Flushing Ave. Brooklyn, NY 11205	Red Hook Waste Water Treatment Plant	2004	On Going	Digester Gas		Grid Parallel
UTC Fuel Cells	NYPA and NYSERDA	2 PC25 200 kW	43-01 Berrian Boulevard, Astoria NY 11105	Bowery Bay Waste Water Treatment Plant	2002	On Going	Digester Gas		Grid Parallel
UTC Fuel Cells	NYPA and NYSERDA	1 PC25 200 kW	751 Mill Road, Staten Island, NY 10306	Oakwood Beach Waste Water Treatment Plant	2004	On Going	Digester Gas		Grid Parallel
UTC Fuel Cells	Chemical Plant in Staten Island, NY	2 PC25 200 kW	Staten Island, NY	Chemical Plant		On Going	Natural Gas		> 40,000 hours logged
UTC Fuel Cells	Niagara Mohawk aka Plum Street Enterprises Buy Down recipient again in FY1996-1997	200 kW PAFC		Liverpool High School			Natural Gas		
UTC Fuel Cells	NORAM aka Reliant Energy Co. with Logan Energy Buy Down Recipient FY1996-1997	200 kW PAFC	Gulfport, Mississippi	Navy Combat Construction Battalion Base	7/1999	On Going	Natural Gas		
UTC Fuel Cells	Oak Ridge National Laboratory Buy Down Recipient FY2000	200 kW PAFC					Natural Gas		
UTC Fuel Cells	Omaha Public Power District Buy Down Recipient FY1999	200 kW PAFC	Omaha, NE				Natural Gas		
UTC Fuel Cells	Onondaga-Courtland-Madison BOCES Buy Down Recipient in FY1995	200 kW PAFC	4340 WETZEL RD LIVERPOOL, NY 13090	Liverpool High School	Dec. 1999	On Going	Natural Gas	Serves as an educational resource for science teachers and eventually will allow the high school to become an emergency shelter during community disasters.	
UTC Fuel Cells	Onondaga-Courtland-Madison BOCES	200 kW PC25 PAFC	Onondaga-Courtland-Madison BOCES, NY	BOCES Regional Information Center (Thompson	1997	On Going	Natural Gas		

 Created by Fuel Cells 2000, All Rights Reserved

				Road)					
UTC Fuel Cells	Sieco SA Buy Down Recipient in FY2000	Three 200 kW PAFC	Brazil, Parana disrtict	Copel Data Center			Natural Gas		COPEL = Companhia Paranaense de Energia (UTC's distribution agent for Latin America)
UTC Fuel Cells	Sieco SA	200 kW PC25 PAFC	Rio de Janeiro, Brazil	Petrobras' R&D Center	Sold in 2002	Being Installed	Natural Gas		Petrobras is Brazil's national oil, gas and energy company. This is the fourth unit to be installed in South Amercia.
UTC Fuel Cells	State of Alaska Buy Down Recipient FY1995	Two 200 kW PAFC	Alaska				Natural Gas		
UTC Fuel Cells	State of Connecticut Buy Down Recipient FY1995	200 kW PAFC	Connecticut				Natural Gas		
UTC Fuel Cells	TBE Germany Buy Down Recipient FY1998	200 kW PAFC systems	Germany	St. Anges Hospital			Natural Gas		
UTC Fuel Cells	DBI Gas (Germany), Technische Universitat Dresden, Gastec N.V.	200 kW PAFC system PC25 C	Kamenz, Germany	Maltesser Hospital	Feb. 2000 (w/ AC – May 2000)	37 month project	Natural Gas		Adsorption Chillers are used to have the fuel cell produce power, heat, and air-conditioning (Non-Nuclear Energy – Thermie program) Dr.-Ing. W. Kuhne DBI Gas +49/3731/365 253
UTC Fuel Cells	Tokyo Gas and Toshiba Corporation	UTC 200 kW PC25A	Tokyo, Japan	Tokyo Gas Research & Developmen t facility	April 13, 1992	4/13/92 - 2000			
UTC Fuel Cells	Tokyo Electric Power Co. (TEPCO) and Toshiba Corporation	11 MW PAFC unit	Tokyo, Japan	Goi Station	March 7 1991	Completed March 1997			This unit accumulated 23,140 hours by 10/00
UTC Fuel Cells	Tokyo Electric Power Co. (TEPCO)	200 kW PC25 PAFC	Japan	Shibaura DHC	March 13 1989	Completed March 1997			This unit accumulated 45,333 hours by 10/00
UTC Fuel Cells	Mitsubishi Electric and Toshiba Corporation	200 kW PAFC PC25	Japan	Kyobashi DHC	Feb. 14 1994	Completed Oct. 2000			This unit accumulated 43,139 hours by 10/00
UTC Fuel Cells	Tokyo Electric Power Co. (TEPCO) and Toshiba Corporation	200 kW PC25 PAFC	Japan	TEPCO R&D Centers	Sept. 20 1994	On going	City gas		This unit accumulated 44,011 hours by 10/00
UTC Fuel Cells	Toshiba Corporation Southern California Gas Buy Down Recipient FY1995	200 kW PC25 Model A	Anaheim, CA	Kaiser Hospital	May 1993	End of Life May 2000	Natural Gas		All End of Life units are removed and placed in storage waiting dismantling and disposal
UTC Fuel Cells	Kaiser Permanente HMO Group, Southern California Gas Company, the Gas Research Institute, and the DOE	Two 200 kW PC25 Model A	Riverside, CA	Riverside Medical Center (Kaiser Hospital)	Sept. 1994	Feb. 2000 + March 2001	Natural Gas		Won the 1994 Efficient Building Award for Energy and the Environment sponsored by Energy User News
UTC Fuel Cells	Toshiba Corporation Buy Down	200 kW PAFC	Heag, Germany				Natural Gas		

 Created by Fuel Cells 2000, All Rights Reserved

	Recipient again FY1995								
UTC Fuel Cells	Toshiba Corporation Buy Down Recipient again FY1995	200 kW PAFC	Japan	Osaka Gas FC R&D Center			Natural Gas		
UTC Fuel Cells	Toshiba Corporation-Power Systems and Service Co. Buy Down Recipient FY1998	200 kW PAFC	Japan	Toshiba Fuchu Works			Natural Gas		
UTC Fuel Cells	Washington Water and Power Buy Down Recipient FY1995	200 kW PAFC	Washington	Avista / Double Tree Inn			Natural Gas		
UTC Fuel Cells	Woking Borough Council Buy Down Recipient FY1998	200 kW PAFC	United Kingdom	Recreation Center at a local pool			Natural Gas		During the winter, it provides heat and electricity; during the summer it powers the air conditioning units
UTC Fuel Cells	Yankee Gas Services Buy Down Recipient FY1996-1997	Two 200 kW PAFC systems	Meriden, CT	Yankee Gas Services Office	Oct. 1997		Natural Gas		
UTC Fuel Cells	Verizon, Long Island, NY Buy Down Recipient FY1999 ($1,400,000)	Seven 200 kW PAFC systems	741 Zeckendorf Blvd., Garden City, Long Island, NY	Major call-routing center serving 40,000 phone lines. Call switching center	2004		Natural Gas		This will be the largest fuel cell deployment project in the world
UTC Fuel Cells	Hotel in Ulsan, South Korea	200 kW PC25 PAFC	Ulsan, South Korea	Hotel			Natural Gas		
UTC Fuel Cells	Sapporo Brewery (AGD) in Chiba, Japan	200 kW PC25 PAFC	Chiba, Japan	Sapporo Brewery		On Going	Digester Gas		
UTC Fuel Cells	Asahi Brewery	200 kW PC25 PAFC	Shikoku Brewery, Japan	Asahi Brewery		On Going	Digester Gas		
UTC Fuel Cells	School in Kaltenkirschen, Gerrmany		Kaltenkirshen Germany	School			Natural Gas		
UTC Fuel Cells	Virginia Power and Virginia Natural Gas in a Gas Research Institute (GRI) field test project	40 kW PAFC cogeneratio n unit	Old Dominium University in Norflok, Virginia	600 bed dormitory	Stalle d in 1986	Concluded	Natural Gas		Since the completion of 42 GRI field test sites in the US and Japan, gas utilities have purchased about 22 200 kW PC25s, four of which are still operating
UTC Fuel Cells	Southern California Gas Company (SoCAL Gas)	200 kW PAFC PC25 Model A	Santa Barbara, CA	Electricity & hot water to Santa Barbara jail	Octob er 1994	Life EndedMarch 2001	Natural Gas		All End of Life units are removed and placed in storage waiting dismantling and disposal
UTC Fuel Cells	Southern California Gas	200 kW PC25 Model A	Irvine, CA	Hyatt Hotel	Sept. 1992	Life Ended March 2002	Natural Gas		All End of Life units are removed and placed in storage waiting dismantling and disposal
UTC Fuel Cells	Southern	200 kW	Buena Park,	Kraft Foods	July	Removed	Natural	N/a	Sold to City of Mesa, AZ

 Created by Fuel Cells 2000, All Rights Reserved

	California Gas	PC25 Model A	CA		1993	June 1996	Gas		
UTC Fuel Cells	Southern California Gas	200 kW PC25 Model A	Los Angeles, CA	SCAQMD Office Building	April 1992	On Going	Natural Gas		
UTC Fuel Cells	Southern California Gas	200 kW PC25 Model A	Santa Barbara, CA	University of California	Sept. 1993	Life Ended June 1998	Natural Gas		All End of Life units are removed and placed in storage waiting dismantling and disposal
UTC Fuel Cells	Commonwealth Gas	PC25 demonstration project	Fall River, MA	US Army Natick Laboratories			Natural Gas		
UTC Fuel Cells	Equitable Resources	200 kW PAFC PC25	Pittsburgh, PA	Presbyterian Nursing Home			Natural Gas		
UTC Fuel Cells	Equitable Resources	200 kW PAFC PC25	Pittsburgh, PA	Riverside Nursing Home			Natural Gas		
UTC Fuel Cells	Peoples' Gas & Light	200 kW PAFC PC25	Chicago, IL	Div. of Street & Meter Repair			Natural Gas		
UTC Fuel Cells	Minnegasco	200 kW PAFC PC25	Minneapolis, MN	USAF Reserve Center			Natural Gas		
UTC Fuel Cells	Jersey Central Power & Light/ GPU	200 kW PAFC PC25	Morristown, NJ	AT&T Research Laboratory			Natural Gas		
UTC Fuel Cells	Gas Company of New Mexico	200 kW PAFC PC25	Alberquerque, NM	Kirkland Air Force Base			Natural Gas		
UTC Fuel Cells	Rocherster Gas & Electric	200 kW PAFC PC25	Rochester, NY	Rochester Institute of Technology			Natural Gas		
UTC Fuel Cells	National Fuel Gas	200 kW PAFC PC25	Buffalo, NY	Riefler Concrete			Natural Gas		
UTC Fuel Cells	AB Parking Facilities, LLC Logan Energy Buy Down Recipient FY1996-1997	3 200 kW PAFC PC25s	Fresno, CA	AB Parking Facilities	Start date 5/2002		Natural Gas		Absorption chiller with fuel cells' waste heat will be used to provide 100 tons of cooling to 12 story commercial building
UTC Fuel Cells	Omaha Zoo	200 kW PAFC PC25	Omaha, Nebraska	Lied Jungle @ Omaha Zoo	Installed 2002	On Going	Natural Gas		The PC25's waste heat is used to warm the water in a number of ponds and heat 5,000 gallons of water used for irrigation each night.
UTC Fuel Cells		200 kW PAFC PC25	Boston, MA	Deer Island	Installed	On Going	Natural Gas		
UTC Fuel Cells		200 kW PAFC PC25	Germany	Bocholt Hospital	Installed 2001	On Going	Natural Gas		Has accumulated more than 7,000 hrs. of uninterrupted operation, setting a European record. Apart from the regular replacement of air filters and scheduled maintenance performed by the hospital's own staff, no service has been required.
UTC Fuel Cells	Connecticut Clean Energy Fund (administered by Connecticut Innovations)	200 kW PC25	South Windsor, CT	South Windsor High School	Installed 10/2002	On Going	Natural Gas		First municipal facility to be powered and heated by a fuel cell in CT. This unit will also server as a basis of a comprehensive fuel-cell curriculum.
UTC Fuel Cells	New Jersey Clean Energy Program Installed by Merck & Company	200 kW PC25	Rahway, NJ	Merck & Company's research facility					Installed under the New Jersey Board of Public Utilities (BPU) statewide initiative. They received a $710,000

 Created by Fuel Cells 2000, All Rights Reserved

									rebate under the New Jersey Clean Energy Program and will receive a $200,000 rebate from DOD's "Buy Down" Program
ZTEK Corp.	Connecticut Clean Energy Fund The Renewable Resources Group, LLC	25 kW SOFC	Rocky Hill, CT	Dinosaur State Park	Installed	On Going	Natural Gas		This system was previously demonstrated at the Tennessee Valley Authority's Huntsville, AL site from 1998 to 2000.
N/a	NJR Power Services Group Buy Down Recipient FY1999	Twenty 7 kW PEM systems							
N/a	District Heating System		Toftlund, Denmark	District Heating System					
N/a	FCTEC http://www.fctec.com/ (DOD)		National Energy Technology Laboratory (NETL)		Coming Soon				
N/a	FCTEC http://www.fctec.com/ (DOD)		Air Expeditionary Force Battlelab (AEFB)		Coming Soon				
N/a	Verizon Boston/Long Island	Smaller fuel cell units	Boston, MA and Long Island, NY	Small field equipment sites in a Boston suburb and Long Island		Operational			
N/a	Verizon NY	Medium Sized fuel cell	Up State NY	Medium-sized facility	Being Planned				
N/a	Pyramid Cos., developers of the proposed $2.2 billion Destiny USA mega mall project	As many as 60 200 kW sized units			Being Planned				Wants to be the world's largest "green" building.
N/a	Celanese Ventures	1 fuel cell system (PEMFC)	Frankfurt, Germany	New PEM membrane manufacturing line	8/2002	Installed			Celanese Ventures makes a membrane for PEMFCs which can be operated at the higher temperature of 150 degrees C. Their new production line is powered by a fuel cell system (Perhaps Ballard?)
Fuel-Cell Commercialization Conference of Japan (FCCJ) – a Janaese 2002 summary	Many manufactuerers	Various	Japan			12 months demo. nominal	Natural Gas; LPG; Naptha		■ 1 kW unit for residential use ■ 5kW unit for business use ■ 12 units (11 1kW; 1 5kW) in FY2002 ■ Sites spread over Japan ■ Units integrated into existing power grid

Notice: For additional information or comments on Fuel Cells 2000's charts, contact Jennifer Gangi at: jennifer@fuelcells.org.

 Created by Fuel Cells 2000, All Rights Reserved