

Fuel Cell Specialty Vehicles

Mfr.	Vehicle	Partners	Year Shown	Fuel Cell Size/Type	Range	Max. Speed	Fuel Type	Commercialization Plans	Picture
Aerovironment	Helios – unmanned aerial vehicle	NASA	2003	10-15kW PEM	250m	17-27mph	2 compressed hydrogen tanks		
Anuvu, Inc.	Fuel cell boat	Millennium Cell, Duffy Electric Boats, Seaworthy Systems	2003	4 1.5 kW PEM	N/a	N/a	Hydrogen from sodium borohydride		
Asia Pacific Fuel Cell Technologies (APFCT)	ZES IV	Kwang Yang Motor Co., Taiwan Institute of Economic Research (TIER), W. Alton Jones Foundation, Desert Research Institute	September 2003	APFCT 1 kW/PEM	60 km/h	35 km/h	Metal hydride on-board hydrogen storage	APFCT, DuPont Fuel Cells and DuPont Taiwan have plans for commercialization in 2005.	
Astris Energi	Golf cart		2001	Alkaline	7-8 hours	40 km/h	Compressed hydrogen gas		
Deere & Company	Pro-Gator™	Hydrogenics, Dynetek	2003	Hydrogenics 20 kW	4 hours	50 km/h	Hydrogen		
ECN	FRESCO scooter	Piaggio		PEM	100 km goal	75 km/h goal	Hydrogen	Project ends November 2004	
EIVD/MW-Line	Hydroxy 3000	Paul Scherrer Institute (PSI)	2003	3 kW/PEM	160 km	10-15 mph	Compressed hydrogen@200bar	Switzerland's first family leisure fuel cell boat	
FASTec/ATP	Fuel cell-powered electric plane	UQM Technologies, NASA, American Ghiles Aircraft, Giner Electrochemical Systems, Satcon Technology Corp., Diamond Aircraft, Analytic Energy Systems, Lockwood Aviation	July 2001	Phase 2 – 25kW Phase 3 – 75 kW	Phase 2 – 250 mi Phase 3 – 500 mi	250mph at sea level	On-board hydrogen		
FuelCell Propulsion Institute	Mine locomotive	Nuvera	2002	Two 17kW PEM	8.5 hours		Metal hydrides		
HaveBlue LLC	X/V-1 Sailboat	Texaco Ovonic Hydrogen Systems, Catalina Yachts	Will be shown in 2004	N/a	N/a	N/a	Metal hydrides	Public demonstrations are planned for 2004 with limited retail availability in 2005.	
Hydrogenics, Inc.	Forklift	Deere & Company, FedEx Canada, General Motors of Canada, HERA Hydrogen Storage Systems, NACCO Materials Handling Group and City of Toronto	N/a	10 KW	N/a	N/a	Metal hydrides		

Kurimoto	Fuel cell wheelchair	APFCT	2003	APFCT 250W/PEM	38mi 60km	3.7mph 6km/h	Pure Hydrogen @150psi	Can keep driving for 10 hours	
Los Alamos National Laboratory (LANL)	Personal mobility vehicle		2002	140W/PEM	N/a	N/a	Hydrogen		
Manhattan Scientifics	Fuel cell Segway	U.S. Army ERDC/CERL, FCTec, Concurrent Technologies Corporation	November 2003	700 W/PEM	Range should double	12-17mph	Compressed hydrogen (2-liter)		
Manhattan Scientifics	Mojito FC scooter	Aprilia s.P.a.	2002	NovArs 3 kW PEM	100 km	55 km/h			
Manhattan Scientifics	Bicycle	Aprilia s.P.a.	2001	600 W/PEM	43 miles	20 mph	Compressed hydrogen (2-liter)		
MTU Friedrichshafen	Yacht	Ballard Power Systems	2003	4.8kW	225 km	12 km/h			
Palcan Fuel Cells Ltd.	Scooter		June 2003	2 kW/PEM		45k/h	Metal hydride stored hydrogen		
Palcan Fuel Cells Ltd.	E-bike	Yamaha	May 2002	500 W PEM		20m/h	Metal hydride		
PEM Technologies, Inc.	PemPower-04 3-wheel motorcycle		June 2003		50 km	30 km/h			
PEM Technologies, Inc.	PemPower-03 2-wheel motorcycle		January 2003		50 km	30 km/h			
Powerzinc Electric	Scooter			ZAFC	150 km	30 km/h			
Powerzinc Electric	Fuel cell/electric bicycle	Shanghai Green Light Electric Bicycle	2002	ZAFC	200 km	20 km/h	Zinc oxide		
Vectrix	Fuel cell/electric hybrid scooter	Parker Hannifin, Giner Electrochemical Systems, GP Batteries, Methanex, Robrady Design	November 2003	DMFC	250 km @ 40 km/h	100 km/h		Initial commercial models are expected to be available in 2006.	