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World Fuel Cells

Industry Study with Forecasts for **2013 & 2018**

Study #2502 | May 2009 | \$5800 | 419 pages

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Market gains will be stimulated by ongoing technological advances, helping drive costs down to competitive levels, and supported by improved economies of scale as production ramps up.

Global commercial market to more than triple by 2013

Fuel cell spending worldwide -- including research and development funding and investment in fuel cell enterprises, as well as commercial sales -- is projected to grow at an 11 percent annual pace through 2013. The commercial market for fuel cells -- including revenues associated with prototyping, demonstration and test marketing activities, as well as actual product sales -- will more than triple to \$1.9 billion in 2013 and almost triple again by 2018. As a result, the share of total fuel cell expenditures accounted for by commercial demand will climb from ten percent in 2008 to 34 percent in 2018. Market gains will be stimulated by ongoing technological advances, helping drive costs down to competitive levels in a growing number of applications, and supported by improved economies of scale as fuel cell manufacturers ramp up production.

Fuel cell systems to expand exponentially

The fuel cell market can be segmented into systems (the fuel cell itself), fuels, separately sold electronic devices and other (including separately sold fuel cell stacks and stack components, fuel storage devices, reformers and processors, and fuel cell-related services). Commercial demand for fuel cell systems, which totaled 17,800 units in 2008, will expand exponentially through 2013, and then climb another sevenfold by 2018.

World Commercial Fuel Cell Demand (\$570 million, 2008)



Portable fuel cell systems to dominate unit sales

Although market gains are projected to be strong for most applications, virtually all of this increase will be attributable to an explosion in portable fuel cell systems demand, which is expected to account for 98 percent of all unit sales in 2018. Demand for portable electronics fuel cells will be spurred by user frustration over the shortcomings of batteries as a power source, and declining costs will help make fuel cells an affordable alternative source of portable power. Fuel cells used in electric power generation applications will account for less than one percent of the total number of systems sold in 2018 but will continue to

make up the largest single share of demand in value terms. Electric power generation fuel cell sales will be stimulated by the relatively low hurdles they have to overcome to achieve cost competitiveness and their much greater fuel efficiency compared to conventional power generation methods. The motor vehicle market will lag overall fuel cell sales growth. Most automotive-related fuel cell demand will continue to consist of revenues generated from the sale of products and services associated with prototyping, demonstration and test marketing activity, and the motor vehicle market's share of total fuel cell sales will fall from 18 percent in 2008 to 11 percent in 2018.

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Sample Text, Table & Chart

ASIA/PACIFIC

Japan: Fuel Cell Outlook & Suppliers -- Overall fuel cell demand is expected to grow at a rate of 15 percent annually through 2013 to \$1.2 billion in 2013 and \$2.5 billion in 2018. Commercial demand in the country will triple to \$2.5 billion in 2018. Exports will also develop and commercialize fuel cell products. Increases will be limited to some extent by a saturated fuel cell market base, as well as by competition from less expensive alternative sources of energy. Examples include microturbines, wind turbines and other renewable energy sources for electric power generation applications, hybrid-electric vehicles -- which combine internal combustion engine technologies with electric motors, generators and high-voltage battery packs -- for motor vehicle applications. There has even been some renewed interest in battery-powered automobiles. For example, Nissan has announced plans to manufacture up to a few thousand all-electric vehicles for fleet use in Japan and the US in 2010, with large-scale commercial production expected to start in 2012. Nevertheless, Japan remains a major global center of fuel cell technology development and commercialization activity for the foreseeable future.

The use of fuel cells in electric power generation applications will grow fivefold through 2013 and double again by 2018, strengthening its position as the largest market in the nation. Sales advances will be stimulated by government-led efforts to install fuel cell-powered CHP units in large numbers of Japanese homes to reduce the country's dependency on energy imports and lower greenhouse gas emissions. Industrial stationary and motive power applications will continue to account for the second largest share of Japanese fuel cell demand through 2018, and portable electronics fuel cells will rise from a small current market base to become the third largest market in that year. To provide one example of commercialization activity in this field, in March 2009 Toshiba reported

TABLE VII-4

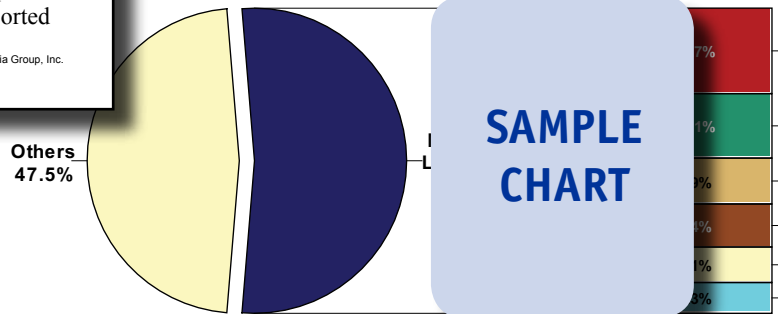
JAPAN -- COMMERCIAL FUEL CELL DEMAND (million dollars)

Item	1998	2003	2008	2013	2018
Population (million persons)	126.0	127.0	128.0	129.0	130.0
\$ fuel cell/capita	0.0	0.0	0.0	0.0	0.0
Commercial Fuel Cell Demand	0.0	0.0	0.0	0.0	0.0
By Application:					
Electric Power Generation	0.0	0.0	0.0	0.0	0.0
Industrial Stationary/Motive Power	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
Other Transportation Equipment	0.0	0.0	0.0	0.0	0.0
Portable Electronics	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0
By Chemistry:					
Proton-Exchange Membrane	0.0	0.0	0.0	0.0	0.0
Molten Carbonate	0.0	0.0	0.0	0.0	0.0
Phosphoric Acid	0.0	0.0	0.0	0.0	0.0
Solid-Oxide	0.0	0.0	0.0	0.0	0.0
Direct Methanol	0.0	0.0	0.0	0.0	0.0
Alkaline	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0
% commercial	0.0	0.0	0.0	0.0	0.0
Total Fuel Cell Spending	0.0	0.0	0.0	0.0	0.0

SAMPLE TABLE

CHART IX-1

WORLD FUEL CELL MARKET SHARE BY COMPANY, 2008 (\$570 million)

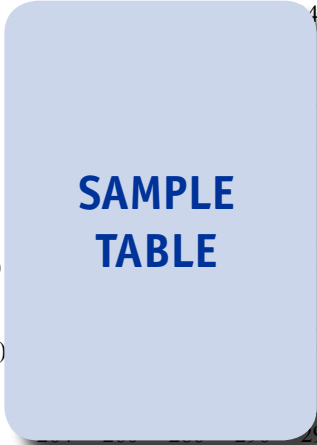


SAMPLE CHART

Sample Profile, Table & Forecast

TABLE VII-3
JAPAN
ECONOMIC & MARKET ENVIRONMENT

Item	1998	2003	2008	2013	2018
Population (million persons)					140
per capita GDP					300
Gross Domestic Product (bil 2007\$)					25
% of GDP					1.1
Gross Fixed Investment (bil 2007\$)					45
kWh/\$ GDP					25
Electric Power Generation (bil kWh)					90
vehicles/mil \$ GDP					20
Motor Vehicle Production (000 units)					10
000\$ electronics/capita					39
Electronic Product Shipments (bil \$)					296



COMPANY PROFILES

Altery Systems
 140 Blue Ravine Road
 Folsom, CA 95630
 916-458-8590
<http://www.altergysystems.com>

Annual Sales:
 Employment:

Key Products

SAMPLE PROFILE

Altery Systems is a privately held company that manufactures and markets PEM fuel cell systems. The Company is a change member of the Fuel Cell Generation Association (FCGA). The Company is a leading provider of PEM fuel cell systems for a variety of applications in the telecommunications, data center, and homeland security markets.

The Company's PEM fuel cell systems are available under the FREEDOM POWER brand name and feature a modular, scalable design that allows additional fuel cell modules to be installed to generate a power output of up to 30 kilowatts. These rugged systems operate quietly and feature remote monitoring and control capabilities. Typical applications for FREEDOM POWER systems include telecommunications facilities, data centers and homeland security operations.

Manufacturing and other activities for Altery Systems are conducted at the Company's 3,150-square-meter headquarters facility in Folsom, California. In June 2007, the Company announced the installation of what it reports is the world's first automated, high-volume fuel cell production line at the Folsom facility. This line is capable of making thousands of fuel cell plates per day. The Company expects to manufacture about 2,000 fuel cell units in 2009.

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"Total fuel cell spending in Japan was \$1.1 billion in 2008, and commercial product and service sales were \$115 million, second behind only the US on both measures. In addition to the substantial investments that are being made by Japanese businesses in fuel cell technology, nonprofit organizations and government agencies are providing support for domestic product development and commercialization efforts."
 --Section VII, pg. 197

OTHER STUDIES

Batteries in China

This study analyzes the Chinese battery industry. It presents historical demand data (1997, 2002, 2007) and forecasts for 2012 and 2017 by type (e.g., zinc-carbon/zinc-chloride, alkaline, primary lithium, lead-acid, rechargeable lithium, nickel-cadmium, nickel-metal hydride) and market (e.g., consumer, industrial, government, electric bicycles and motor vehicles, portable devices, motive power, backup power). The study also considers market environment factors, evaluates company market share and profiles industry participants.

#2466 06/2009..... \$5200

World Battery Materials

Global demand for materials used in the manufacture of batteries will rise 3.9% yearly through 2012. Gains will be driven by strong growth in the production of Li-Ion and Ni-MH batteries. Metals will remain the leading battery material while chemical materials grow the fastest. This study analyzes the \$18.8 billion world battery material industry, with forecasts for 2012 and 2017 by type, application, world region and for 19 countries. It also evaluates market share and profiles industry players.

#2477 04/2009..... \$5600

Batteries

US demand for primary and secondary batteries will reach \$16.8 billion in 2012. Growth will be supported by healthy demand for battery-driven electronics and a shift toward higher-priced, better-performing batteries. In the secondary battery segment, the rapidly growing market for hybrid vehicles will boost demand for Ni-MH and Lilon batteries. This study analyzes the \$14.9 billion US battery industry, with forecasts for 2012 and 2017 by product and market. It also evaluates market share and profiles industry players.

#2449 01/2009..... \$4800

World Batteries

Global battery demand will increase 4.8% annually through 2012. China will record the largest gains and surpass the US as the largest market. Consumer battery demand will outperform the market as a whole. Non-lead-acid secondary battery market gains will outpace demand for primary and lead-acid secondary batteries. This study analyzes the \$71 billion world battery industry, with forecasts for 2012 and 2017 by product, market, world region and for 32 countries. It also evaluates market share and profiles industry players.

#2375 10/2008..... \$6100

Fuel Cells

US commercial fuel cell demand will expand nearly sixfold through 2012 to \$975 million. Electric power generation will remain the largest market and grow 41% annually, bolstered by ongoing interest in less energy pollution and foreign dependency. Portable electronics will be the fastest growing market and benefit direct methanol fuel cells. This study analyzes the US fuel cell industry, with forecasts for 2012 and 2017 by product and market. It also reviews technology, evaluates market share and profiles major players.

#2328 04/2008..... \$4500

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