World Fuel Cells

Industry Study with Forecasts for **2015 & 2020**

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The share of total global fuel cell expenditures accounted for by commercial demand will rise from one-eighth in 2010 to nearly half of all outlays in 2020.

Commercial demand to more than triple by 2015

Global fuel cell spending -- including research and development funding and investment in fuel cell enterprises, as well as commercial sales -- is forecast to climb 10.9 percent annually to $10.2 billion in 2015 and then nearly double to $19.0 billion in 2020. Commercial demand for fuel cell products and services (including revenues associated with prototyping, demonstration and test marketing activities, as well as actual product sales) will more than triple to $2.9 billion in 2015 and then triple again to $9.3 billion in 2020. As a result, the share of total fuel cell expenditures accounted for by commercial demand will rise from one-eighth in 2010 to nearly half of all outlays in 2020. Market gains will be driven by continuing technological advances, helping bring costs down to competitive levels in a growing number of applications, and bolstered by improved economies of scale as fuel cell manufacturers increase production.

World Commercial Fuel Cell Demand, 2010
($780 million)

photo: Bloom Energy

Portable electronics to be fastest growing application

Commercial sales of fuel cell systems, which totaled 23,000 units in 2010, will expand exponentially through 2015 to about 1.6 million units and then rise another sevenfold to 11.3 million units in 2020. Market gains are projected to be strong for most applications, but virtually all of this increase will be attributable to an explosion in demand for portable fuel cell systems, which will account for 97 percent of all unit sales in 2020. The market for portable electronics fuel cells, most of which are currently utilized in niche applications like defense and educational toys, 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.

Although fuel cells used in motor vehicle applications will account for only one-half of one percent of the total number of systems sold in 2020, they will make up the largest single share of demand in dollar terms. A number of major automakers have announced plans to begin offering fuel cell vehicles commercially in 2015 or before, and sales are forecast to ramp up from what are currently extremely modest levels, consisting mostly of revenues associated with prototyping, demonstration and test marketing activities. With a number of products already on the market, electric power generation applications accounted for well over half of all commercial fuel cell demand in 2010. Electric power generation-related fuel cell sales will continue to grow at a brisk pace through 2020, benefiting from relatively low hurdles to overcome to achieve cost competitiveness and much greater fuel efficiency compared to conventional power generation methods.

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Sample Text, Table & Chart

ASIA/PACIFIC

Japan: Fuel Cell Outlook

Commercial demand for fuel cell products and services is projecte illion in 2015 and billion in to make this the la national f uel cell spending in increase ion in 2015 and rea billion in y an intense nation develop a ology. To provide of exampl launched an upgrad of its CHP fuel cell system, which costs about 20 percent less previous model, and in October 2011 ENEOS CellTech (a jo between JX and the SANYO Electric subsidiary of Panasoni introduce a residential CHP power unit that will be more com cost 20 percent less than the prior model.

SAMPLE TEXT

Overall fuel cell sales gains are expected to be impressi will be limited to some degree by the nation's already better- market base compared to most other areas, as well as by com from less costly alternative sources of energy. In May 2011, Honda commercially introduced the MCHP1.0K2 residential gas-fueled engine cogeneration unit in Japan, a product that the firm reports has a combined power and heat generation efficiency of 92 percent. This unit -- which competes with ENE FARM CHP fuel cell systems offered by ENEOS CellTech, Panasonic and Toshiba -- is also much less expensive.

Electric power generation applications will continue to account for more than half of all commercial fuel cell demand in Jap 2020, spurred by government-led efforts to install CHP units numbers of Japanese homes to reduce the country's depende energy imports and lower greenhouse gas emissions. Howev vehicle-related product and service sales will grow at a cons faster pace, and in 2020 this market will account for nearly c

TABLE VII-4

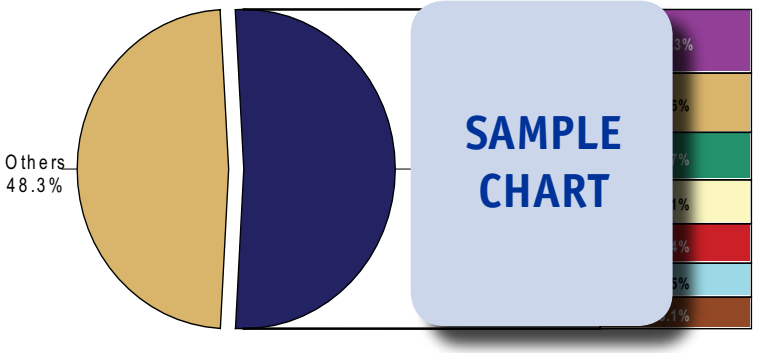
JAPAN - COMMERCIAL FUEL CELL DEMAND
(million dollars)

Item	2000	2005	2010	2015	2020
Population (million persons)					2
$ fuel cell/capita					1
Commercial Fuel Cell Demand					0
By Application:					
Electric Power Generation					0
Motor Vehicles					0
Other Transportation Equipment					1
Industrial Stationary/Motive Powe					0
Portable Electronics					0
Other					9
By Chemistry:					
Proton-Exchange Membrane					0
Solid-Oxide					5
Molten Carbonate					2
Phosphoric Acid					9
Direct Methanol					4
Alkaline					3
Other					7
% commercial					9
Total Fuel Cell Spending					350

SAMPLE TABLE

CHART IX-1

WORLD FUEL CELL MARKET SHARE BY COMPANY
($780 million, 2010)



SAMPLE CHART

World Fuel Cells

Industry Study with Forecasts for ***2015 & 2020***

Sample Profile, Table & Forecast

TABLE VII-3

JAPAN - ECONOMIC & MARKET ENVIRONMENT

Item	2000	2005	2010	2015	2020
Population (million persons)					
per capita GDP					
Gross Domestic Product (bil 2009$)					
% of GDP					
Gross Fixed Investment (bil 2009$)					
kWh/$ GDP					
Electric Power Generation (bil kWh)					
vehicles/mil $ GDP					
Motor Vehicle Production (000 units)					
000$ electronics/capita					
Electronic Product Shipments (bil $)					

SAMPLE TABLE

COMPANY PROFILES

Electro Power Systems SpA
Via Livorno, 60
10144 T
Italy
39-11-22
http://wv

Annual
Employ

Key Pro ll systems

SAMPLE PROFILE

Electro Power Systems is a developer and manufacturer of proton-exchange membrane fuel cell systems for backup power applications in the telecommunications, utility and government markets. The Company is privately held.

Fuel cell systems from the Company consist of products available under the ELECTROSELF, DOX and AIRTECH brand names. The ELECTROSELF self-recharging fuel cell system, which was introduced in December 2010, has a power output from 1.5 kilowatts (kW) to 12 kW and eliminates refueling requirements by generating hydrogen from the water produced by the system during power shortages. In February 2011, Electro Power Systems launched the ELECTROSELF 2 unit, which is engineered to be smaller and more efficient with higher performance than the previous ELECTROSELF model.

The DOX system, which is produced in 6- and 12-kW models, features direct injection of hydrogen and oxygen for enhanced robustness as well as low weight, noise and maintenance requirements. This system can be utilized in areas with unfavorable air conditions. The AIRTECH system, which is available in 3- and 6-kW models, offers

"In 2010, total spending on fuel cell-related activities in Japan was $1.3 billion, and commercial demand for fuel cell products and services was $227 million. The nation is second behind the US in total fuel cell spending and represents almost as large a commercial market, reflecting the substantial investments that are being made by Japanese businesses, nonprofit organizations and government agencies in fuel cell technology. For instance, ..."
--Section VII, pg. 208

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Other Studies

Batteries

This study analyzes the US battery industry. It presents historical demand data for the years 2000, 2005 and 2010, and forecasts for 2015 and 2020 by battery type (e.g., alkaline, lithium, zinc-air, lead-acid, nickel-metal hydride, nickel-cadmium) and market (e.g., consumer, industrial, motor vehicle, portable device, motive power, backup power, government). The study also considers market environment factors, details industry structure, evaluates company market share and profiles industry players.

#2781 ..... August 2011 ..... $5100

World Batteries

Global battery demand will rise 4.8 percent yearly through 2014. China will remain the world's largest national market, while India will register the strongest sales growth. Non-lead-acid secondary battery demand will outpace primary and lead-acid secondary batteries. This study analyzes the $86.2 billion world battery industry, with forecasts for 2014 and 2019 by chemistry, product, market, world region and for 16 countries. It also evaluates company market share and profiles industry participants.

#2703 ..... November 2010 ..... $6300

World Turbines

Global demand for turbines is projected to increase 6.1 percent annually through 2014. Growth will be driven by the wind turbine segment, but the large turbine engine sector will also post strong gains. The Asia/Pacific region will be among the fastest growing markets and expand its share of demand. This study analyzes the $98.7 billion world turbine industry with forecasts for 2014 and 2019 by product, application, world region and for 22 countries. It also evaluates company market share and profiles industry competitors.

#2689 ..... November 2010 ..... $5900

Batteries in China

Demand for batteries in China will grow 8.5 percent yearly through 2013. Growth will be driven by increasing output of battery-powered products and an ongoing shift toward value-added batteries for export. Secondary batteries will grow nearly twice as fast as primary batteries, driven by transportation markets. This study analyzes the 188 billion yuan battery industry in China, with forecasts for 2013 and 2018 by technology, product and market. It also evaluates company market share and profiles industry participants.

#2630 ..... May 2010 ..... $5200

Solar Energy Products in China

Solar energy product demand in China will grow 16.6 percent annually through 2013. Solar thermal collectors will remain the dominant type while photovoltaic modules grow the fastest from a small base. Central-East China will continue as the largest regional market. This study analyzes the 23.4 billion yuan solar energy product industry in China, with forecasts for 2013 and 2018 by type and region. It also evaluates company market share and profiles industry participants.

#2613 ..... April 2010 ..... $5300

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