



## ***US Must Compete for Green Fuel Cell Jobs***

A worldwide race is under way to commercialize and deploy fuel cells for transportation, power generation and personal power, and reap the green jobs and economic benefits that come with marketplace success.

Governments at all levels are maneuvering for their economic share, led by Germany, Korea, China and Japan. The US lacks a long term, forward looking commercialization strategy for fuel cells, creating the risk that these green jobs will go elsewhere, despite current US technical leadership.

### **What's at Stake**

- **The US Department of Energy (DOE)**<sup>1</sup> says 361,000 to 675,000 new jobs are possible by 2035 in fuel cells and hydrogen.
- **The Korean Government** projects as many as 3 million fuel cell jobs.
- **Private Forecasters** say the global fuel cell industry could create 700,000 green manufacturing jobs over the next decade.

### **Can the US Compete?**

The US has the lead in many fuel cell sectors, but lacks a long-term policy commitment. Congress can and should fix this problem by expanding and extending investment tax credits, supporting deployment of early commercial systems and fueling infrastructure, and putting fuel cells on par with advanced energy generation systems and vehicles in the national energy strategy.

### **In the States**

State Governments recognize the economic potential of fuel cells.

- **Connecticut:** The hydrogen and fuel cell industry **contributed \$29 million in local tax revenue, and over \$340 million in gross state product** in 2006. It is estimated that approximately 7,100 jobs and \$1 billion in economic activity will be created with 50 MW of consistent annual production of hydrogen and fuel cell manufacturing, generating \$400 million in tax revenue.
- **South Carolina** estimates it has received a **10 to 1** return for its fuel cell investment
- **Ohio** has invested over \$80 million in fuel cells through a variety of different programs.

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<sup>1</sup> [http://www.hydrogen.energy.gov/pdfs/epact1820\\_employment\\_study.pdf](http://www.hydrogen.energy.gov/pdfs/epact1820_employment_study.pdf)

## Did You Know?

**A fuel cell is an electro-chemical device** that combines hydrogen and oxygen to produce electricity, with heat and water as its only byproducts. In principle, a fuel cell operates like a battery, but does not run down or require recharging. It will produce energy in the form of electricity and heat as long as fuel is supplied.

### Fuel Cell Benefits:

- ❖ **High quality, reliable power**
- ❖ **High efficiency**
- ❖ **Exceptionally low / zero emissions**
- ❖ **Modularity / scalability / flexible installation**
- ❖ **Silent operation**
- ❖ **Lightweight / long-lasting**
- ❖ **Can be used with or instead of batteries and diesel generators**

### Fuel cells are being tested or deployed in the following applications:

- ❖ **Portable** – soldier power applications in the field, consumer electronics, auxiliary power units
- ❖ **Vehicles** – cars, buses, trucks, materials moving equipment, shuttles, golf carts, wheelchairs, bicycles, motorcycles, scooters, boats, submarines, airplanes, trains, mining vehicles, military all-terrain vehicles
- ❖ **Stationary power** – hospitals, hotels, municipal buildings, breweries, data centers, wastewater treatment plants, universities, high schools, police and fire stations, food production facilities, cell phone towers, E-911 and homeland security critical communications, airports, and many more

### Fuel cells can use a variety of energy sources, including:

- ❖ **Hydrogen**
- ❖ **Hydrogen rich fuels.** Hydrogen is separated from these fuels using steam and heat:
  - **Traditional:** natural gas, gasoline, diesel, propane,
  - **Renewable/alternative:** methanol, ethanol, landfill gas, biogas, methane, ammonia
- ❖ **Water.** Hydrogen is separated from water molecules when an electric current passes through water
- ❖ **Renewable/alternative:** electricity from solar, wind, hydropower or geothermal power
- ❖ **Innovative:** sodium borohydride, algae, peanut shells, and industrial gases are just a few of the potential sources being examined

### Fuel cells are here today.

- ❖ According to Fuel Cell Today, **almost 25,000 fuel cell units were shipped in 2009.**
- ❖ Some fuel cell systems have achieved **billions of kilowatt hours (kWh) of successful operation** at customer sites worldwide, **including many Fortune 500 companies.**
- ❖ Fuel Cells 2000 estimates that there are **at least 500 fuel cell forklifts currently deployed** and we expect to see another **1,000 fuel cell forklifts, if not more, shipped in 2010.** These forklifts will be located in 18 states.