Comments on Development of Regulations for the Alternative and Renewable Fuel and Vehicle Technology Program

To: California Energy Commission
Dockets Office, MS-4
Re: Docket No. 08-OIR-1
1516 Ninth Street
Sacramento, CA 95814-5512

From: Katrina Fritz Intwala
Plug Power Inc.
(518) 738-0369

November 3, 2008

Subject: Docket No. 08-OIR-1
AB118 Regulations

I represent Plug Power Inc. and would like to express support of the revised Proposed Draft Regulatory Language for the Alternative and Renewable Fuel and Vehicle Technology Program. Plug Power is a leader in the development of energy systems utilizing fuel cells for material handling lift trucks, stationary power applications and emergency backup power. Plug Power has long espoused the values of sustainability and is commercializing fuel cell systems that contribute to our country's energy independence. We would like to inform you that there is an immediate way to achieve a critical mass of fuel cell and hydrogen fuel deployment in the short-term, while automotive adoption increases. The strong customer pull associated with this technology and hydrogen fueling infrastructure can facilitate achievement of the AB118 investment plan and promote alternative fuels and vehicles.

We would like to inform you that there is an immediate way to achieve a critical mass of fuel cell and hydrogen fuel deployment in the short-term, while automotive adoption increases. PEM fuel cells are proving to be attractive to replace traditional solutions, such as batteries, LPG lift trucks and diesel generators. Fuel cell products for material handling and extended run backup power are commercially available *today*. They provide an environmentally friendly way to reduce emissions, and increase the use of alternative fuels. California has long taken a leadership role in adopting new energy technologies and building the hydrogen economy. We support the development of the hydrogen infrastructure for commercially available fuel cells in the material handling industry as a short-term step in building the hydrogen highway across California *now*.

Support for hydrogen fueling infrastructure needs to be expanded beyond automotive fueling stations to fully catalyze the onset of commercial hydrogen infrastructure. Supporting a larger scale central fueling station will increase the economic value proposition to the customer by reducing the cost of hydrogen, leading to more rapid technology adoption. Purchases of fuel cell systems by customers and consumers will leveraged against the State's investment in the hydrogen fueling infrastructure.

To date, the California Hydrogen Highway funding has focused on fueling for passenger vehicles. To facilitate current market adoption of hydrogen fuel cells in numerous applications, the highway needs to consider clusters of activity along the hydrogen highway corridor, rather than as discreet fueling stations along a single road. Cluster activity would support hydrogen fueling and use of fuel cells in stationary applications and automotive and material handling vehicles. Initial sites could be replicated across the state, which in turn leads to jobs in the clean energy sector, economic gains for end users, and environmental benefits to the state.

California is one of only six states with liquid hydrogen production already in place, and the only state with two such sites. This allows support to be focused on transportation and fueling infrastructure, rather than hydrogen generation. This infrastructure investment by the State will support adoption by a larger set of end customers in several applications. As an example of a cluster, a public refueling area could be sited for fuel cell passenger vehicles and transit fleets. From there, liquid hydrogen could be transported a short distance to distribution centers and manufacturing facilities in nearby industrial parks that are using fuel cells in lift trucks replacing lead-acid batteries and propane engines. Hydrogen from the central station could also be used to fuel small stationary fuel cells that replace diesel generators as emergency backup power. All of these hydrogen fuel cell technologies are being used today in commercial applications. Alternatively, because of the large volumes of hydrogen fuel used in material handling applications, these distribution centers and manufacturing plants could act as central points to an emerging cluster.

The revised regulatory language reflects the reality of current commercial potential of sustainable, alternative fuels and technologies. We support this language and the potential projects that can lead to the immediate acceleration of hydrogen and fuel cell technology adoption by commercial customers in the State of California.

BACKGROUND INFORMATION

Motive Power Fuel Cell Benefits

- Fuel cells used in material handling applications make a compelling economic case in many markets. Companies such as Wal-Mart, Nissan, and Bridgestone are using fuel cells and hydrogen refueling in distribution center and warehouses today. These companies are seeing positive value generated by labor savings, productivity improvements and reduced maintenance. They are also being used in military supply logistics.
- Collectively, the North American market opportunity to supply hydrogen to distribution centers is measured in billions of dollars. The approximately 100,000 class 1, 2, 3 and 4 lift trucks in California provide cost effective, controlled industrial settings for distributed hydrogen refueling capability. Individual warehouses represent the opportunity to build a commercial scale hydrogen infrastructure with consistent high utilization and predictable adoption.
- Refueling of fuel cells requires less than one minute, greatly decreasing vehicle and operator downtime. Fueling dispensers can be located strategically around a factory or warehouse and eliminate the need for a battery room and free up additional commercial space. Labor costs

associated with changing batteries are eliminated and there is less wear on equipment caused by battery droop.

- Safe, clean, and efficient technology eliminates emissions and toxic chemicals. Fuel cells produce zero harmful emissions during operation and, unlike batteries, do not create lead or sulfuric acid waste. They also directly reduce emissions where they replace LPG lift trucks.
- Fuel cell units fit into the existing equipment space occupied by batteries, eliminating the need for retrofits and making it a cost-effective and easy solution for customers to adopt.

Stationary Fuel Cell Benefits

- A recent FCC ruling mandates eight hours of backup power for cell sites, remote switches and digital loop carrier system remote terminals that are normally powered from local AC commercial power.
- Network reliability requirements are increasing due to increased competition and new services, causing a correlated increase in power consumption and network reliability requirements. Overlay work requires the ability to add incremental power, while weak infrastructures warrant extended runtimes (24 to 48 hours)
- There are fuel cells being used today at sites across the State of California. Carriers are aware of the pending regulations, looking to extend their backup power capability and evaluating diesel generators, lead-acid batteries and fuel cells as potential options.
- The FCC ruling may result in the proliferation of diesel generators for backup power at cell sites in California. There are approximately 27,000 cell sites in California. Based on our experience with telecommunications companies, we estimate 10,800 of these sites are using diesel generators. Over five years, this equates to reducing significant emissions by the equivalent of over 1,600 automobiles. The use of fuel cells avoids these emissions.
- In backup applications, fuel cells can provide power for critical infrastructure such as communication systems and water utilities.
- Fuel cell systems are designed to stringent standards developed by the telecommunications industry that qualify equipment under extreme environmental conditions and require specific levels of technological resiliency including temperature extremes, wind-driven rain, altitude, earthquake and ballistics tolerance.
- When fueled by hydrogen from a renewable energy source such as solar, wind, or hydropower, or if the fuel source is bio-fuel, like ethanol from plant wastes, CO2 emissions are net zero.
- Fuel cells can provide highly reliable electricity. Some studies estimate that power quality and reliability issues cost our economy alone as much as $150 billion per year in lost materials and productivity, while others have reported estimates as high as $400 billion per year.