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February 20, 2015

Lead Commissioner Andrew McAllister  
California Energy Commission  
1516 Ninth Street  
Sacramento, California 95814-5512

**Comments of the California Energy Business Council on Request for Public Comments on 2015 Integrated Energy Policy Report Scoping Order (Docket No. 15-IEPR-01)**

Dear Commissioner McAllister:

The California Energy Business Council (CHBC) would like to thank you for the opportunity to comment on the draft 2015 Integrated Energy Policy Scoping Order. CHBC is comprised of more than 80 organizations and individuals involved in the business of hydrogen energy. Its mission is to advance the commercialization of hydrogen in transportation and stationary power provide economic value and to reduce local and global emissions.

Our comments relate to how Hydrogen Energy Storage (HES) can play an important role within the Californian energy mix and help the state meet the Governor’s targets of 50% renewable generation, in addition to providing a renewable fuel for the natural gas network. We feel that HES is currently underrepresented in the energy planning process for the State of California.

Due to the unique characteristics of HES outlined in this document CHBC also recommends a review of the IEPR plan with a view to harmonizing synergistic activities such as the ISO’s recently published Energy Storage Roadmap, the CPUC’s energy storage procurement requirements, and the CEC’s EPIC, PIER and hydrogen infrastructure programs.

**Hydrogen as an energy storage medium**

As the percentage of renewable electricity generation increases in California, so will the occurrences of load imbalance. This has already been seen in areas of Europe such as Germany and Denmark and is evidence of the necessity for energy storage.

HES via the electrolysis of water provides one of the only routes to storing large amounts of energy (TWhrs) for long periods of time (seasonal storage) in a format that allows use of pre-existing gas storage assets.

HES provides a rapid response energy storage mechanism that is able to simultaneously charge and discharge energy, with the added benefit of producing a fuel for transportation or heat. Using electrolyzers that are constantly available to absorb or release load to an increasingly renewable Californian grid provides a huge potential for end use flexibility.

Storage can be achieved by utilizing existing natural gas pipeline/storage assets together with the potential for salt cavern storage. This can be done via direct injection of hydrogen (Power to Gas) into a natural gas pipeline or by combining hydrogen with waste CO<sub>2</sub> to produce synthetic natural gas (methanation). Storing renewable electricity as a gas ultimately provides a renewable natural gas supply while reducing the amount of renewable energy that is curtailed.

### **Hydrogen as a transport fuel**

HES via electrolysis can not only be used to provide power and heat but can also be used to provide fuel for thousands of fuel cell and CNG vehicles within California using renewable electricity.

The idea that all energy storage needs to complete a round trip from electricity in to electricity out should be revised to energy in to energy out. Motive power is a valid use for energy and electrolysis provides a unique solution to planning the fuelling schedule of zero emission vehicles. Hydrogen fuel cell and natural gas vehicles do not share the constraints of battery electric vehicles in terms of their requirements to be plugged into a grid to charge. The fuel generation is done independent of the location of the vehicles; electrolyzers positioned on the grid so that they are always available to receive power remove the need to control when vehicles are being recharged.

The fact that hydrogen and synthetic methane are both gaseous fuels allows for transport via pipeline, further simplifying the process and ensuring maximum flexibility.

### **Hydrogen as a flexible use solution**

HES via electrolysis is the only technology that allows for the storage of renewable energy in a vector that can simultaneously benefit the electricity, gas, renewable heat and transport sectors of California.

CHBC recommends a review of the historic 'silos' for electricity, gas and transport fuel and creation of programs that fund cross cutting technology with the potential for multiple sector benefits.

Sincerely,



Jeff Serfass  
Managing Director  
California Hydrogen Business Council