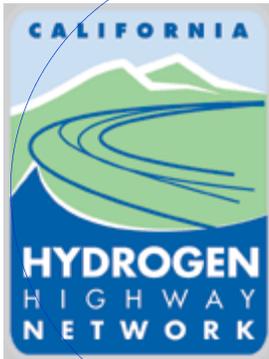


DRAFT



CaH2Net Update

WINTER 2008

ARB AWARDS \$7.6 MILLION FOR THREE NEW H2 STATIONS

INSIDE THIS REPORT:

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The ARB awarded \$7.6 million for three new hydrogen stations. These new stations will increase publically accessible infrastructure in preparation for increased hydrogen fuel cell vehicles from General Motors, Honda and others. Two stations are located in the greater Los Angeles area, and the other near Oakland, in Northern California.

Fountain Valley

\$2.7 million was awarded to co-fund a station in Fountain Valley located at the Orange County Sanitation District Facility. Air Products and Chemicals, Inc. will be installing a new 350/700 Bar station that will dispense 100% renewable hydrogen produced from digester gas from waste water utilizing a molten carbonate fuel cell. The station, co-located with Com-

pressed Natural Gas (CNG) dispensing, will provide up to 100 kilograms per day (kg/day) dispensing seven days a week.

California State University, L.A.

\$2.2 million was awarded to California State University, Los Angeles (CSULA) who will operate a 60 kg/day, 350/700 Bar station using electrolysis powered by 33.3% renewable solar and wind energy. The station will be built on the east edge of the campus, adjacent to the electric vehicle (EV) charging station and complement the universities Power, Energy and Transportation curriculum.

Alameda-Contra Costa County Transit District

\$2.7 million was awarded to the

Alameda-Contra Costa County Transit District to establish, operate and maintain a new 350/700 Bar hydrogen station in Emeryville. The station will have the capacity to dispense at least 60 kg/day of hydrogen derived from 100% renewable resources. A new photovoltaic array will provide some of the electrical load. The station will be co-located with a second hydrogen facility that will dispense an additional 120 kg/day exclusively for transit and heavy duty vehicle use. These three stations are due to be fully operational by the end of 2009.

For more information, please contact Michael Kashuba at (916) 323-5123.

ARB TO SOLICIT/FUND ADDITIONAL HYDROGEN STATIONS

The Air Resources Board will be releasing a winter grant solicitation of approximately \$7 million for additional hydrogen refueling infrastructure. This next round of funding will request grant proposals from qualified teams to install op-

erate and maintain temporary or “modular” skid mounted type stations. When released, the grant solicitation may be accessed on the California Hydrogen highway website.

For more information, please contact Michael Kashuba at (916) 323-5123.

Keep in touch with the latest news on the CaH2Net by signing up for our list serve at <http://www.hydrogenhighway.ca.gov>

HYDROGEN ROAD TOUR '08 FINISH LINE

After 31 stops in 18 states, stretching from Maine to California, the Hydrogen Tour '08 crossed the finish line on Saturday, August 23, 2008, at the L.A. Coliseum. A 13-day, cross-country trip showcased hydrogen fuel cell cars from nine automakers, hydrogen transit buses, and mobile refueling stations marking a historic trek of clean, efficient hydrogen vehicles. The goal of the Hydro-



Chevy Equinox FCV on display at the California State Science Center, Los Angeles.

gen Road Tour was to showcase the progress that industry and government have made together, and emphasize the next steps to commercialization even as R&D continues.

Hydrogen Road Tour '08 was a collaborative effort between the California Fuel Cell Partnership, U.S. Department of Transportation, U.S. Department of Energy and National Hydrogen Association giving people across America a chance to interact with the hydrogen vehicles and learn how they are fueled.

Hydrogen vehicles from BMW, Daimler, GM, Hyundai-Kia, Nissan, Toyota, Honda and Volkswagen made the journey, and were joined by hydrogen buses from Sunline Transit Agency. Air Products and Chemicals, Inc. and Linde provided mobile

refueling stations and hydrogen throughout the trip. The caravan of hydrogen-powered vehicles drove roughly 20,000 combined miles and use domestically produced hydrogen. During the trip the vehicles produced zero tail pipe emissions. Contact: Josh Boone 916.323.0004



Honda's FCX Clarity crossing the finish line at the L. A. Coliseum.

RENEWABLE HYDROGEN WORKSHOP IN GOLDEN, COLORADO

In September, 2008, ARB participated in National Hydrogen Association's renewable hydrogen forum held in Golden, Colorado. Panelists from the U.S. and state government agencies, private industry and research institutions convened to address current topics on hydrogen and renewable energy. The Forum was designed to provide an interactive venue for government, industry and academia to work side by side to discuss needs and challenges and how those needs can be met to facilitate market transition to a sustainable hydrogen economy.

Technical presentations included topics such as: hydrogen as storage medium for stranded wind energy assets; hydrogen production using algae and microbes; microbial fuel cells; and hydrogen production

waste-derived biogas. Dale Gardner of the National Renewable Energy Lab (NREL) provided an overview on the current status of state and federal funding for hydrogen, and Michael Eckhart of ACORE gave a practical perspective of financing renewable energy and hydrogen projects.

Much of the remainder of the forum focused on hydrogen infrastructure projects underway in other states and countries. Since California has the most hydrogen fueling stations in any geographic area, ARB used the forum to share the state's experiences associated with limited station access and prohibitive liability agreements. We then dis-

cussed how these experiences and input from automakers have shaped our current approach to station financing and developing bid criteria based on vehicle deployment needs.

Contact: Leslie Goodbody 916.323.2961



Forum participants take tour of NREL's new Solar Lab

STATION OPENINGS IN ARCATA AND WEST LOS ANGELES

Schatz Energy Research Center christened the northern most point of the California Hydrogen Highway at their station's grand opening on September 4, 2008. Situated on the Humboldt State University (HSU) Campus in Arcata, this station is meeting the needs of a Quantum Prius conversion provided to Schatz by ARB's Hydrogen Highway funding. Chevron Technology Ventures, Caltrans, North Coast Unified Air Quality Management District, and O&M Industries also collaborated on this project.

This station can produce 2.3 kilograms per day using grid electricity and store 12 kilograms of hydrogen – enough to maintain a fleet of four hydrogen powered cars. Schatz is currently researching opportunities to tap into

landfill gas and solar power to meet the stations electricity needs. Schatz is no stranger to producing hydrogen from solar power having built California's first solar hydrogen fueling station at Sunline Transit headquarters in Thousand Palms.

At the opening ceremony, US Congressman Mike Thompson shared his pride that two universities within his district, UC Davis and HSU, are on the cutting edge of green technology and are well recognized in hydrogen circles for their training, R&D and educational efforts.

Shell Hydrogen LLC, opened California's first hydrogen refueling station on a conventional Shell gasoline forecourt in West

(Continued on page 9)



HSU Hydrogen Fueling station and hydrogen-powered Toyota Prius.

POLICY UPDATE

Environmental Standards for Hydrogen

Senate Bill 1505 requires ARB to develop regulations for transportation hydrogen. The regulation will require that hydrogen production and delivery result in lower emissions of criteria pollutants and greenhouse gases compared to a gasoline baseline, and that a percentage of that hydrogen be made from renewable resources. Development of the regulation has been delayed due to a dilemma with the definition for renewable resources, which, if used, would qualify only hydrogen produced from renewable electricity as "renewable." ARB is currently working with the authors of the legislation to modify it to include the direct use of renewable feedstocks in the bill's definition of renewable resources. Work on the regulation is ongoing with staff planning to go to the Board when new renewable definition is in place.

Contact Ben Deal (916.322.8449)

ZEV Mandate

On March 27, 2008 the Air Resources Board voted to retain the 25,000 pure zero emission vehicle (ZEV) requirement between 2012–2014 and provided a compliance alternative that would result in more than twice as many advanced technology vehicles. The alternative compliance option allows manufacturers to comply with the ZEV Program with 7,500 Type IV ZEVs such as long-range full function electric and fuel cell vehicles while meeting the remainder of the ZEV requirement with approximately 58,000 plug-in hybrid electric vehicles (PHEVs). The Board has also directed staff to redesign the 2015 and subsequent model year ZEV Program requirements. Under the redesign, the ZEV Program would serve as an incubator, supporting ZEV technology research and development, and focusing exclusively on pure ZEVs.

Contact Anna Gromis (916.323.2410)

Alternative and Renewable Fuel and Vehicle Technology Program

This program, promulgated under Assembly Bill 118 (2007), authorizes the legislature to appropriate to ARB up to \$80 million per year for 7 ½ years for enhanced fleet modernization, the Air Quality Improvement Program (AQIP) and retirement of gross polluting vehicles. ARB is considering using a portion of the AQIP allocation for ZEV vehicles incentives. AB 118 also authorizes the legislature to appropriate to the California Energy Commission up to \$120 million annually for 7 ½ years to disburse incentives to projects that, among other things, produce alternative and renewable low-carbon fuels in California, and expand fueling infrastructure, fueling stations, and equipment. At this point, the Commission has not disclosed how much of this funding will be allocated toward hydrogen fueling stations.

<http://www.arb.ca.gov/msprog/aqip/>

CALIFORNIA FUEL CELL PARTNERSHIP—BUILDING MARKET FOUNDATIONS

2008-2011 marks Phase III of the California Fuel Cell Partnership (CaFCP). The focus of the CaFCP during Phase III is on building the foundation for a fuel cell vehicle market. CaFCP members will use collaborative efforts and a collective voice to make a smooth transition from passenger vehicle and transit demonstration programs to an early-commercial market.

In July, 2008, CaFCP released a consensus vision of how the transition from demonstration programs to the early commercial market can take place. The groundbreaking document provides clear projections about the numbers of stations, numbers of vehicles and investment needed from government and industry over the coming years.

For people to accept any new product, it must be safe, convenient, familiar and easy

to use. Through 2011, CaFCP members will work together to prove and communicate that fuel cell vehicles and hydrogen fuel meet these requirements.

During Phase III, CaFCP has four overarching goals:

- Identify and address market opportunities and challenges.
- Promote a safe, customer-friendly refueling experience.
- Work toward a common fuel delivery architecture.
- Provide information and hands-on experience.

The California Fuel Cell Partnership is a collaboration of member organizations working together to promote the commercialization of hydrogen fuel cell vehicles. CaFCP members include automotive manufacturers, energy providers, government agencies, fuel cell technology companies and transit agencies. Through collaboration, the members share what they have learned, develop common practices and prepare California communities for hydrogen-powered fuel cell vehicles.

For more information about the CaFCP, go to www.cafcp.org or call (916) 371-2870.



Photo: DUmale

The West Sacramento facility provides service bays for all eight automotive members. Here, they service and test the vehicles in Northern California. Photo courtesy of the CaFCP.



Photo: CaFCP



Photo: CaFCP

CLEAN AND COOL—HYDROGEN OUTREACH AT THE CAPITOL

On May 28, 2008 the Second Annual, Hydrogen and Fuel Cell Reception and Outreach Event took place on the North Steps Lawn at the State Capitol. The event, organized jointly by Energy Independence Now (EIN) and the California Hydrogen Business Council with support and coordination from the California Fuel Cell Partnership and the California Air Resources Board, served as a forum for decision-makers and the public to learn about hydrogen and fuel cell technology. In particular, the goal of the event was to provide an educational forum for discussion of the economic, environ-

mental, and public health benefits of hydrogen and fuel cell technology for California, to highlight progress and recent achievements, and to urge continued support from the public.

Sponsored by a range of hydrogen and fuel cell stakeholders including General Motors, Honda, Air Products, Hydrogenics, Intelligent Energy, AC Transit, Center for Energy Efficiency and Renewable Technology, and Coalition for Clean Air, there were information displays as well as a “ride and drive” organized by the California Fuel Cell Partnership. Finally, as part of a coast-to-coast inno-

vation tour looking at advanced transportation technologies, the U.S. Department of Transportation Research and Innovative Technology Administration joined the event with department officials and U.S. congressional staffers. The event, attended by an estimated 300 individuals this year, is becoming an important annual opportunity to keep decision-makers and the public up to date on technology advances and deployment progress.

For more information, contact Daniel Emmett, EIN, at (805) 899-3399.



Clean and Cool. Legislative Outreach Day for the CaH2Net. Photo courtesy of the CaFCP.



Ford Focus FCV. Photo courtesy of the CaFCP.



Ford Focus FCV and Chevy Equinox Fuel Cell Vehicle on the steps of the Capital. Photo courtesy of the CaFCP.



Chevy Equinox Fuel Cell Vehicle on the steps of the Capital. Photo courtesy of the CaFCP.

FUEL CELL VEHICLES: ANNOUNCEMENTS AND UPDATES

HONDA

Starting in July 2008, Honda delivered the first five FCX Clarity hydrogen-powered fuel cell vehicles to customers in Southern California: actresses Jamie Lee Curtis and Laura Harris; Producer Ron Xerxa; and car enthusiasts Jim Salomon and Jon Spallino. Honda also established a network of dealers in Costa Mesa, Santa Monica and Torrance to facilitate the lease and service of fuel cell vehicles.

Honda plans to deliver about 200 FCX Clarities in the first three years of production. The lease program marks the world's first large-scale retail initiative for fuel cell vehicle technology. Honda will identify additional customers from a group of over 50,000 individuals who have expressed interest in the FCX Clarity on the company's website.

- From Honda Press Releases, June 16, 2008

GENERAL MOTORS

As part of a comprehensive deployment plan called "Project Driveway," Chevrolet has supplied almost 70 Chevrolet Equinox Fuel Cell electric compact SUVs to private, commercial and government customers in New York, Sacramento, Los Angeles and Washington, D.C. Customers began test-driving the vehicles for a time frame of between three and 30 months earlier this year. The EPA-certified zero emission Equinox Fuel Cell SUV is powered by GM's fourth-

generation fuel cell propulsion system and meets all applicable 2007 U.S. Federal Motor Vehicle Safety Standards. The vehicle includes a range of safety features found on other Chevrolet cars, including driver and front passenger air bags, anti-lock brakes, and GM's OnStar telematics service, which will offer drivers advice on operating the cars as well as information on nearby hydrogen filling stations.

- From GM Press Releases, June 2, 2008

DAIMLER

In 2010, Daimler will begin with series production of one fuel cell vehicle per day in the B-Class, according to Dieter Zetsche, Chairman of the Board of Management of Daimler AG and Head of Mercedes-Benz Cars. Zetsche was quoted in the May 28, 2008 issue of AEI Online, "While some time ago we came to the conviction that we could offer a totally competitive product based on a fuel cell in the foreseeable future, we did not consider this could be done on an economically feasible basis. Meanwhile, we have invested a lot of time, brains, and money into the development and ultimately mass production for fuel cells, with the result that today we are convinced that by 2014-15 we can offer technically and economically competitive fuel-cell vehicles in the range of 100,000 plus units a year." "We are very, very serious about fuel cells," he said. "We will have mass-production vehicles with-

out emissions in the timeframe I have outlined. We have to."

- From AEI-Online "Technology Report," May 28, 2008



Benz B-Class with fuel-cell drive has passed its winter testing in northern Sweden with flying colors.

- March 19, 2008 media release.

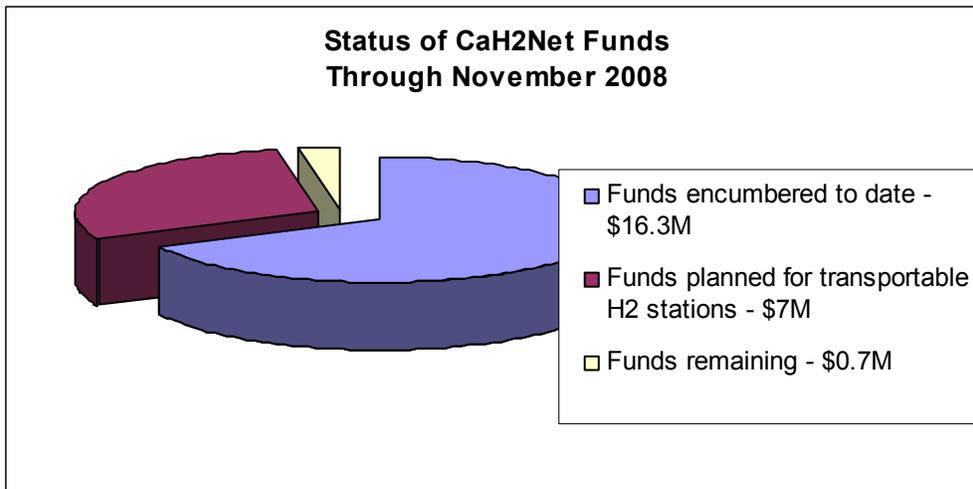
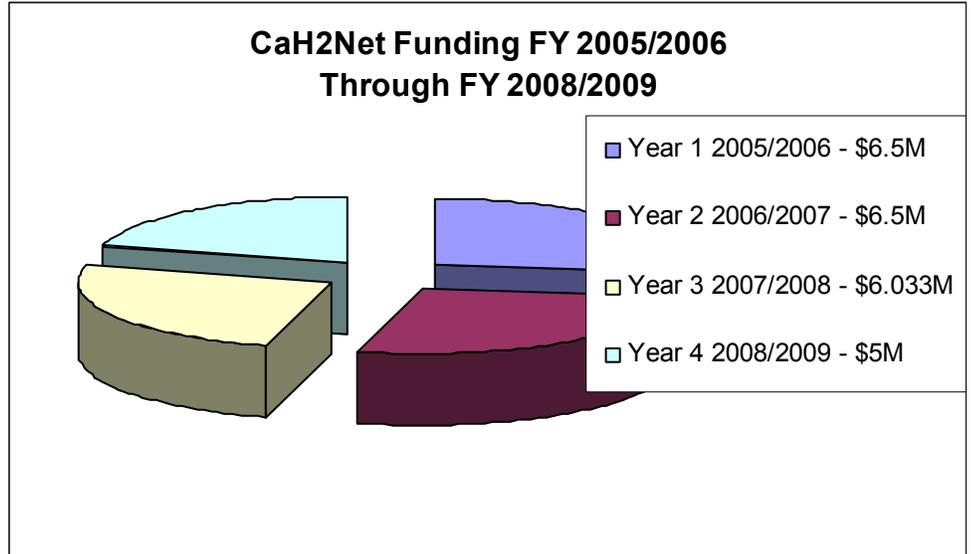
FORD MOTOR COMPANY

Ford recently announced that they are extending their hydrogen fuel cell electric vehicle program through the end of 2009. Ford's fleet of 30 Focus fuel cell vehicles, launched in 2005, has exceeded expectations of the company's hydrogen research engineers by accumulating more than 865,000 real world miles without significant maintenance issues since the fleet's launch three years ago. These test vehicles also have earned accolades from the company's global fleet partners for outstanding durability, reliability and capability. Ford is developing a next generation fuel cell vehicle that will build on the success of the current program with improved performance, reliability and efficiency.

- From Ford Press Release, August 19, 2008.

HYDROGEN HIGHWAY FINANCIAL SNAPSHOT

Since 2005, the California Hydrogen Highway (CaH2Net) has been appropriated \$24.033 million to fund the State's share of various activities related to hydrogen vehicles and infrastructure. This graph describes the total funding received from fiscal year 2005/2006 through fiscal year 2008/2009.

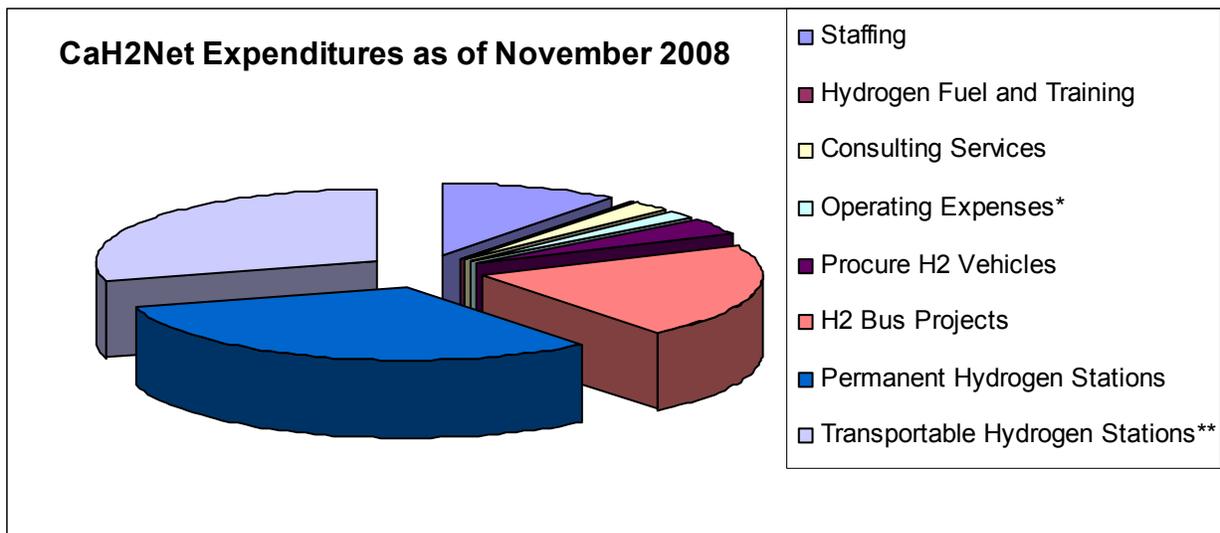


To date the State has encumbered over \$16.3 million of the CaH2Net funds. Another \$7 million Request For Proposal will be released later this year for the installation of transportable hydrogen fueling stations.

HYDROGEN HIGHWAY FINANCIAL SNAPSHOT-CONT'D

The graph below describes what the CaH2Net funds have been used for as of November 2008:

- Staffing.
- Supplying the State's fuel cell vehicles with hydrogen fuel and provide training for vehicle refueling.
- Consulting services to assist the State with implementing infrastructure and demonstration targets identified in the Blueprint Plan; conduct targeted communication with environmental, industry, and public stakeholders; and assist with the development of education and communication materials.
- Operating expenses including a contract with the California Department of Food and Agriculture to develop fuel specifications for hydrogen.
- The procurement of hydrogen vehicles and shuttle buses.
- Deployment of hydrogen bus projects .
- Developing permanent, temporary and transportable hydrogen fueling stations that are publicly accessible and meet the environmental requirements of Senate Bill 1505.



* Includes contract with the CA Dept. of Food and Agriculture

** Funds are not encumbered but solicitation for transportable hydrogen stations is planned for the end of calendar year 2008.

Keep in touch with the latest news on the CaH2Net by signing up for our list serve at <http://www.hydrogenhighway.ca.gov>

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The California Hydrogen Highway Network is an initiative to establish hydrogen infrastructure to support commercialization of sustainable, zero and near zero emission hydrogen vehicles.

The CaH2Net is a key part of California's strategy to achieve the State's vision of a secure energy future that simultaneously addresses our environmental, public health and economic challenges working in partnership with other components of the State's programs to advance energy efficiency and renewable energy.

STATION OPENINGS—CONT'D

(Continued from page 3)

Los Angeles. Located on Santa Monica Boulevard near the 405 freeway, the station joins the California Hydrogen Highway Network, and gives consumers a taste of the future, with refueling services for hydrogen powered fuel cell vehicles becoming just as convenient as conventional gasoline motors.

Hydrogen at the Shell station is produced on-site by electrolysis using green electricity purchased from the Los Angeles City Department of Water & Power. Due to space constraints, Shell opted to place the hydrogen production and storage components on the canopy above the dispenser. The station can dispense 30 kilograms of hydrogen per day and is

supporting the U.S. Department of Energy hydrogen infrastructure program by supplying hydrogen to vehicles made by major auto manufacturers and approved conversions, such as the Quantum Prius.

Graeme Sweeney, Executive Vice President for Shell Future Fuels and CO2 said: "California is leading the way with clean fuels, as it moves one step closer to realizing its hydrogen program, FCVs powered by hydrogen will provide a sustainable transportation choice for the future, opening up new markets across the globe. This requires the sustained effort of energy companies, auto manufacturers and federal and state governments working together. We are pleased to be playing our part to help develop a safe and reliable fueling infrastructure for future clean en-

ergy vehicles, as the only major energy company involved in FCV vehicle demonstrations in all three major hydrogen markets – North America, Japan, and Europe."



Hydrogen dispenser at Shell's West LA gasoline station at Santa Monica Blvd. and Federal Ave.