

CAN's Solar Hydrogen Vehicle Facility is Up

by James J. Provenzano, Executive Director, Clean Air Now!

Clean Air Now, a California nonprofit public advocacy corporation, has recently completed its ground-breaking “Solar-Powered Hydrogen Generating Facility and Hydrogen-Powered Vehicle Fleet” technology deployment demonstration project. The project is located on two-thirds of an acre, at Xerox Corporation’s El Segundo facilities, just south of the Los Angeles [California, U.S.A.] International Airport (LAX). The project is the largest and only fully permitted solar-powered hydrogen-generating facility in the country. It comprises a major portion of the developing hydrogen energy infrastructure in Southern California, which now supplies fuel for some of the few private sector hydrogen-powered vehicles in operation.

Clean Air Now’s demonstration project in El Segundo, California, U.S.A, uses solar electricity to generate hydrogen; the hydrogen produced powers a fleet of vehicles.



The system demonstrates a private, practical application of hydrogen fuel. The fuel is generated on-site from just sunlight and water. The generation and compression systems are 100 percent stand-alone, off-grid systems. Only the feedwater, hydrogen sensing, and data acquisition requirements are supported by conventional means.

The facility is running at 100 percent of its designed performance standards. The photovoltaic (PV) electrolysis output, at this time of year, is peaking at an average of 2,500 Amps at 15 Volts, producing an average of 300 SCF of hydrogen per hour. (The electrolysis system is capable of producing 400 SCF of hydrogen per hour.) Included in the project is high-pressure gaseous storage of 15,000 psi, which supports three retrofitted, hydrogen-powered, internal combustion engine, Ford utility pickup trucks with 3,600 psi gaseous on-board storage. The vehicles have a range of up 140 highway miles.

Clean Air Now was a recipient of a White House Technology Reinvestment Project award and a State of California pollution abatement award that helped fulfill its project objectives. Clean Air Now was within budget for the project and performed beyond its original scope. We are proud to say that all the project subcontractors more than fulfilled their obligations, especially The Electrolyser Corporation (TEC) and Praxair, Inc., for which Clean Air Now owes debts of gratitude. TEC, through its solid commitment and “beyond contract” performance, made the facility a reality. Praxair supplied invaluable technical assistance early in the project, providing a level of technical comfort to Clean Air Now and Xerox Corporation which allowed us to move forward with the additional phases of implementation.

Thanks go to the other “partners” as well, including the U.S. Department of Energy, Xerox Corporation, the South Coast Air Quality Management District, Photovoltaic International, Advanced Machining Dynamics, Energy Technology Engineering Center/Boeing North America, University of California at Riverside, W. Hoagland & Associates, Inc., Touchstone Technologies, and the City of West Hollywood [California].

CAN has entertained thousands of students, dignitaries, and other people at the facility, fostering a greater awareness and understanding of the benefits of renewable hydrogen energy and cultivating additional inquires and development efforts. We have produced documents that are educating and assisting others in their efforts to implement hydrogen energy systems. These safety assessments, performance analyses, and permitting documents have been distributed and are available to those who ask.

We have participated in forums, conferences, and outreach activities that have spawned greater discourse, awareness, and activity in renewable hydrogen energy technologies and their implementation. Programs such as CAN’s project lead to greater public acceptance of hydrogen technologies, improving their support in public policy debates and advancing their use in mainstream energy scenarios.

Clean Air Now is currently in the process of site determination for relocation of its hydrogen generation facility. Xerox Corporation, because of new requirements, is in need of the parking lot currently occupied by the PV-electrolysis systems. (This project has been more than five years in the making.) Xerox will retain the fueling station and commercial hydrogen storage capacity to allow continued hydrogen vehicle service in the western region of the Southern California Hydrogen Corridor. This affords us the unique opportunity to maintain a hydrogen presence near LAX, while making available 40 kilowatts of renewable hydrogen generation capability for the nucleus of a new and improved hydrogen infrastructure site and testing ground.

Clean Air Now is inviting industry and government agencies to dialogue. It is our intent to capitalize on our development by making it available to opportunities within industry and government. We wish to apply our lessons learned and capital investment to facilitate bringing hydrogen energy closer to commercialization, for

commercialization holds an important (some might say the only) aspect to hydrogen's rapid acceptance and integration into our energy economy. There exist many possibilities for Clean Air Now's cooperation with a new site host and potential partners or owners.

Clean Air Now envisions the development of an infrastructure "supernode" in southern California or Nevada [U.S.A.], where our facility will be the hub of a larger and more varied application of hydrogen energy and related technologies. In an exciting initiative, the California Hydrogen Business Council is currently in discussions with CALSTART to plan the possible relocation of CAN to the Burbank, California, airport. This supernode will allow the hydrogen energy industry to: (1) further facilitate codes and standards development and evaluation; (2) affect public policy debate; (3) continue public education programming; (4) pursue collaborative efforts in risk reduction assessments in large-scale infrastructure development; and (5) move closer to some economies of scale to aid in more favorable financials. Clean Air Now can think of no greater value for the industry and taxpayers' dollars already spent than to use the facility, based on an industry/U.S. Department of Energy consensus, to bring society closer to the renewable-hydrogen economy we all seek.

We hope that hydrogen energy will receive the attention it deserves and the funding commensurate to its problem-solving potential. Clean Air Now finds the lack of exhortation for hydrogen by the "hydrogen energy industry" and the (collective) government disappointing, given the U.S. Department of Energy's budgets for fusion and coal, and the worldwide subsidies presently given to the fossil fuel industry. We also find it perplexing why greater cooperation and collaboration are not developed with the renewable energy industries, for hydrogen is an enabling technology for renewables' widespread implementation and application.

We at Clean Air Now feel the taxpayers have received substantial value for their investment in this part of the renewable hydrogen energy economy. We continue to work so that, someday soon, our facility will no longer be the largest, and the only permitted, one of its kind in the country.

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