

*CAN/Xerox Hydrogen Project Relocation  
to SunLine Transit Agency*

---

“From Demonstration to  
Commercialization”

*or*

“From the Public to the Private for the Public”

U.S. Department of Energy Hydrogen Program Annual Review  
Denver, CO

May 5, 1999

James J. Provenzano, Executive Vice President Clean Air



## *Summary of Approach & Rationale*

---

- ✦ Capitalize on \$ & effort expended, & region
- ✦ Assist commercial application within the transportation sector
- ✦ Expand developing infrastructure for hydrogen delivery
- ✦ Lessons learned and people trained
- ✦ Improve public exposure/health
- ✦ Maintain renewable aspect of generation
- ✦ Technology integration and evaluation (comparative)
- ✦ Industry restructuring a plus; grid storage
- ✦ Equipment upgrades
- ✦ More miles



## *Past Results*

---

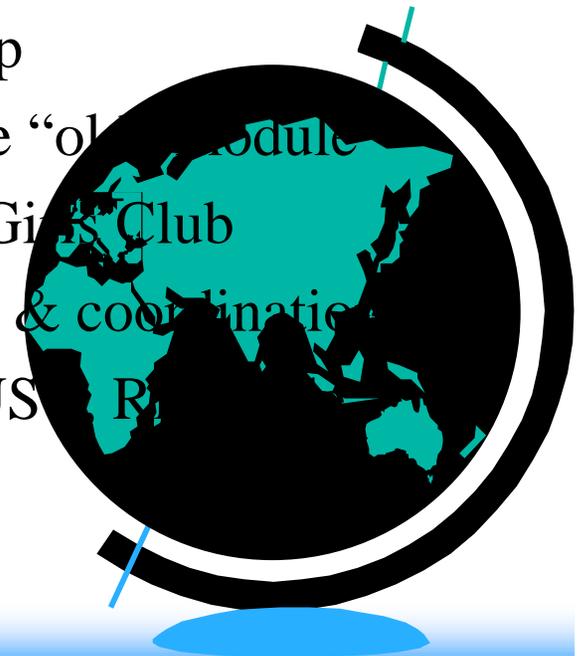
- ✦ Country's largest & 1st fully permitted solar hydrogen facility & hydrogen powered vehicle fleet. (TRP, AQMD, private \$)
- ✦ Safety assessments published and widely used
- ✦ 3 H2 ICE w/emissions testing & permits
- ✦ Publications, videos, press
- ✦ Outreach, tours, conferences, shows
- ✦ Practical experience
- ✦ Employment
- ✦ Construction experience with systems
- ✦ Systems improvement



## *Current Year Results*

---

- ✦ Signed agreements & funding cost-share
- ✦ Site layout/preliminary site construction
- ✦ Engineering & structural being performed
- ✦ Permitting process is underway
- ✦ Equipment determination; “P3” ready to ship
- ✦ Plans w/U.S. Department of Energy to move “old” module
- ✦ Part of “old” array will be used by Boys & Girls Club
- ✦ UC Davis project funded/project integration & coordination
- ✦ Tours & conferences (Leuzinger, AQMD, US EPA, RMI, etc.)



## *Plans for Future Work*

---

- ✦ Turn over operation to SunLine, assets to DOE
- ✦ Davis/Sacramento Project
- ✦ Public Education & Outreach
- ✦ Education Center @ SunLine
- ✦ Assist with inter-agency committee
- ✦ Stress health effects of air pollution
- ✦ Health Effects video
- ✦ California Fuel Cell Partnership
- ✦ Educate policy makers
- ✦ Help Dr. Zweig retire



## *Status of Economic Evaluation*

---

- ✦ Project conducive to comparative analysis
- ✦ SunLine SOW
- ✦ Increased availability of direct recharging of fuel cell vehicles
- ✦ Increased employment in hydrogen energy technologies
- ✦ Increased experience
- ✦ Psychological factor
- ✦ Potential site for California Fuel Cell Partnership implementation
- ✦ Reduced emissions = healthier public



## *Major Barriers/Safety Issues*

---

- ✦ Lack of Codes & Standards
- ✦ Boeing North America
- ✦ Public perception
- ✦ Lack of experience with H<sub>2</sub> within permitting agencies
- ✦ Education
- ✦ Reliable compressors
- ✦ Storage (tankage) certification
- ✦ \$ going to onboard reforming
- ✦ Training
- ✦ Detection



## *Status: Technology Transfer & Partners*

---

- ★ U.S. Department of Energy
- ★ Clean Air Now
- ★ SunLine Transit Agency & SunLine Services Group: CNG
- ★ South Coast Air Quality Management District
- ★ Stuart Energy Systems: Systems improvement
- ★ Matrix Engineer & Contractors: Experience
- ★ PhotoVoltaics International: System improvement
- ★ Imperial Irrigation District: Restructuring & remote power application/load leveling potential w/renewables
- ★ Hydrogen Components, Inc.
- ★ Daimler-Chrysler (SunLine)

