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# *Hydrogen* Today

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## Show Me the Hydrogen



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Hysolgenics ( [www.hysolgenics.com](http://www.hysolgenics.com) ) in San Jose is solving the hydrogen supply problem. Their M2-EL solar or wind powered electrolyzers will supply H<sub>2</sub> for cooking, heating or absorption cooling. The portable unit will also run their RE 1500 watt Fuel Cell Generator. The M2-HFS high pressure refueling station will provide up to 10,000 PSI hydrogen to refill your car's H<sub>2</sub> fuel tank. See a demonstration video at:

<http://www.youtube.com/watch?v=veZmluuGEh4>

### *“Quotations”*

“I never let schooling interfere with my education.” (Mark Twain)

“Spectacular achievements are always preceded by unspectacular preparation.” (Robert Schuller)

“Nothing in life is to be feared, it is only to be understood. Now is the time to understand more so that we fear less.” (Marie Curie)

“You shouldn't start vast projects with half-vast ideas.” (Unknown)

*‘We Deliver Clean Air’*

Hydrogen Today:  
Journal of the American  
Hydrogen Association  
2350 W. Shangri La Rd.  
Phoenix, AZ 85029 USA  
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\*\* SAFETY FIRST \*\*

## Here's the Deal

By Roy McAlister  
President of the American Hydrogen Association

### *RENEWABLE ENERGY PARKS*

#### *INTRODUCTION:*

The Industrial Revolution presently depends upon a rapidly depleting supply of fossil resources that provide energy at the embarrassingly low efficiency of about 0.1% (one tenth of one percent of the solar energy once intercepted by plants.) Originally photosynthesis converted less than 0.6% of the available solar energy to biomass. Assuming that half of the ancient biomass miraculously turned into coal, oil or natural gas and is converted to electricity in today's modern power plants at 35% efficiency and the electricity is delivered through the grid at 90% efficiency, then only about 0.09% of the available sunlight is available in modern times as electricity.

This energy is being consumed at an increasing rate. Within one human lifetime, most of the oil reserve will be gone. Remaining dependent upon fossil fuels dooms the Industrial Revolution to energy starvation, economic collapse and degradation of civilization as we know it. Waiting millions of years for nature to replenish the fossils reserve is an unacceptable alternative.

#### *RENEWABLE ENERGY PARKS:*

There are much better options. Renewable electricity or hydrogen can be generated at an efficiency of more than 23%. Delivery through existing electricity or pipeline grids will result in efficiency that is 200 times greater than continuing to depend upon fossil based energy.

Renewable Energy Parks have been conceived as *sustainable* energy sources that convert solar, wind, tidal, wave, biomass and municipal waste into electrical and hydrogen energy. The American Hydrogen Association has developed a plan for integrating these Wind Energy Parks in Canada and the Dakotas; Solar Energy Parks in California, Nevada, Arizona, Mexico, Texas and New Mexico; Wave Energy Parks along ocean coasts; and Biomass Energy Parks near communities and farms all over North America through the electrical and gas pipeline grids. Electric power that is generated in excess of immediate demand will be converted and stored as electrolyzed hydrogen or flywheel kinetic energy.

### *PROJECT SUPPORT:*

Communities and individuals that provide land tracts, capital and other assistance will receive rent or royalties on the sale of energy. Equity sharing is encouraged where it is competitive with other financial arrangements and conducive to the accomplishment of sustainable prosperity.

### *FREE ENTERPRISE:*

Competitive bids will be solicited to landscape selected park sites and install renewable energy conversion equipment. Installation bidders will be required to provide plans for removing equipment and restoring the land if the technology becomes obsolete.

After turn-key installations and proof-of-performance testing by contractors, Renewable Resource Parks will be operated and maintained by contractors selected by additional bidding.

### *SCOPE OF PROJECT:*

Development of Renewable Energy Parks will stimulate virtually every segment of the North American economy. Equipment requirements will exceed that of the current automobile industry. Building Renewable Energy Parks will keep contractors busy for the next 35 years as North America installs solar dish gensets, wind generators, wave generators, photovoltaics and municipal waste conversion equipment. The most needed achievement of the Industrial Revolution is creating Renewable Energy Parks for sustained prosperity without pollution.

Peaceful, healthful and profitable conversion of the Industrial Revolution to the Renewable Resources Revolution will be facilitated by the creation of Renewable Energy Parks.

## H2 on the Internet

Eden Full, a 19-year-old Canadian engineering sophomore at Princeton, invented a \$10 PV panel solar tracker made out of bamboo and a scrap metal bimetallic strip that she calls the Sunsoluter. Tracking the sun increases output by 40%. She has received a \$100,000 award from the Thiel Foundation to commercialize her product. Listen to what she has to say:  
<http://ecoliving.scotiabank.com/sunsoluter-10000-winner-of-the-ecoliving-2011-student-leadership-award>

The Department of Energy has guaranteed a \$737 million loan to California's SolarReserve to build a 110MW Solar Power Tower near Tonopah, Nevada. 17,500 mirrors will concentrate sunlight on a boiler atop a 653 foot tower. Heat from 1000° F molten salt produces steam for turbine generators 24 hours a day.  
<http://cleantechnica.com/2011/05/22/first-large-scale-247-solar-plant-to-be-constructed-in-u-s>

Entrepreneurs from Tempe, Arizona and Salt Lake City are collecting commercial vegetable scraps and composting it into garden soil. [www.ecoscraps.net](http://www.ecoscraps.net)

Are you in the market for a house? How does \$300 sound? The \$300 house project wants to design and build a few billion \$300 homes for those who now live in slums. A billion of us have to live on a dollar a day. <http://www.300house.com>

## Editorial

A huge benefit of being an AHA member is how much you grow while working on projects with other members. Some of the challenges I've seen in the last month are:

- Read a Radio Frequency Identification (RFID) device.
- Find a tech manual for a TMQ-42 Hydrogen Generator.
- Create a Quickbooks chart of accounts.
- How to translate "Solar Hydrogen Civilization" into Braille.
- Chemically analyze a 500 pound stainless steel plate.

These important activities keep us busy, but for me the real challenge is remembering that the AHA mission is to save the world. What is more important than that? We need to be asking ourselves how many people in the last month we educated about hydrogen. How many people in your neighborhood started cleaning the air with a hydrogen car? How many new hydrogen filling stations opened in your town?

Instead of adding more to your schedule, try taking something away. I know how easy it is to burn an hour on Youtube. Give yourself some regular quiet time where you just sit and think about life. It should be pretty clear by now that the solutions to our economic problems are going to come from the bottom up. Wherever you are, whatever your age, don't stop learning and don't stop teaching.

## Hydrogen Events

The Phoenix American Hydrogen Association now meets the second Thursday of every month from 6 to 8pm at Denny's restaurant, 650 N. Scottsdale Rd. in Tempe, AZ (SW Scottsdale Rd/202, one mile north of ASU light rail station). Call 480-964-0458 or 480-229-0828 for details. Our guest for July 14<sup>th</sup> will be Don Titmus from Four Directions Permaculture. ( <http://4dirs.com/fdpc/index.htm> )

## Books & Publications

Generators and Inverters: Building Small Combined Heat and Power Systems for Remote Locations and Emergency Situations, Stephen Chastain, 2006  
Chastain Publishing, \$34.95, 351 pages.

Chastain is a mechanical engineer so he has the background for what he's talking about. In spite of the title, the book does not tell you how to bolt together a power system with parts from Napa and Home Depot. It's more of a collection of notes or an encyclopedia. He covers pertinent topics- governors, designing & winding springs, balancing flywheels, wiring, engine to load calculations, reducing vibration and engine noise, corrosion, fuel tanks, batteries and designing heat exchangers. He discusses propane and natural gas and there's a dozen pages on biodiesel. Instructions and photos are included for making parts, but he expects you to pour your own castings and machine the parts. These are not skills acquired

overnight, but they can be easily learned at your local vocational school. Some of his projects lacked a completed photograph so you're not quite sure what you're making is supposed to look like. This is a book for those of us who like to get dirty. See his other books on sand casting, making your own pistons and iron melting furnaces at: <http://stephenchastain.com>

Why We Hate the Oil Companies: Straight Talk From an Energy Insider, John Hofmeister, 2010. Palgrave MacMillan, \$21, 249 pages.

John Hofmeister was president of Shell Oil from 2005 until his retirement in 2008. Since then he has founded Citizens for Affordable Energy.

Hofmeister is no apologist for Big Oil. He starts out bashing renewables. Your computer will shut down whenever the wind stops blowing and birds will be mashed by the turbine blades. (What about the millions mashed by automobiles?) It's wasteful to invest money and land in low efficiency solar energy. He hates coal pollution, but believes we have to continue using coal. If they get the bugs out, nuclear will be a source of "carbon-free electricity forever."

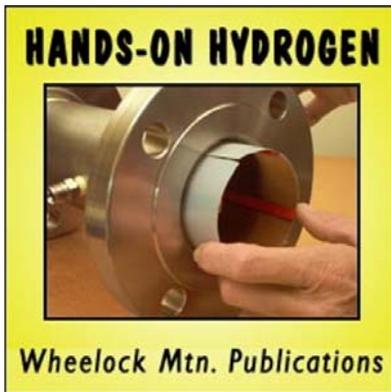
He states there is plenty of affordable oil and natural gas available to keep our country running. Probably true. He condemns bought politicians and environmental lawyers equally for preventing companies from getting the oil. Also probably true. Therefore, we're in big trouble. Do you want to start an energy project? Don't go to the DOE. Apply instead to Homeland Security and the Department of State and the Department of the Interior and the Department of Agriculture and the EPA.

There's a little less hate when you learn Shell has contributed hundreds of millions of dollars into the ongoing recovery of New Orleans. Whatever you think about Big Oil, they've done what WE asked them to- fill our fuel tanks for over 100 years.

As a good executive, he provides solutions. He calls for a Federal Energy Board consisting of long-term appointed professional from energy producers, transportation, economics, science, labor, agriculture and the environment. The board would:

- Create a land use policy to eliminate mountain top mining and wasteful city traffic gridlock.
- Become a world leader in carbon-free energy by developing genuine clean coal technology.
- Find solutions for nuclear wastes.
- Modernize the energy infrastructure.
- Stabilize energy prices.
- Develop systems to treat gaseous wastes like we now handle solid wastes and wastewater.

Hofmeister concedes that no one in Washington would give up power to such a board. He believes we'll need to go to the ultimate source of power in America- grassroot citizens. We're going to need a lot more energy and renewables by themselves will not be enough. Hating oil companies does nothing to help. The lesson to learn is that a major source of pollution is the half-truths put out by vested interests.



*Ebooks for Do-It-Yourself Experimenters*  
*By Phillip Hurley*

- Build Your Own Fuel Cells....\$14.95
- Build A Solar Hydrogen Fuel Cell System....\$16.95
- Practical Hydrogen Systems: An Experimenter's Guide....\$16.95
- Build Your Own Solar Panel....\$12.95
- Solar II....\$12.95
- Solar Hydrogen Chronicles....\$12.95
- Solar Supercapacitor Applications....\$16.95
- The Battery Builder's Guide....\$16.95

<http://www.goodideacreative.com/wheelockmtn.html>

Good Idea Creative Services  
324 Minister Hill Rd.  
Wheelock, VT 05851

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## H2 University

### Minus Emissions

Those who drive electric vehicles can boast zero emissions, provided they recharge with renewable electricity. What does the AHA mean when we claim that a hydrogen-fueled internal combustion engine produces 'minus-emissions?' As you know, burning hydrogen produces pure water. However, much of the air that enters the cylinders is loaded with a myriad of contaminants like smoke and benzene. Many of these hydrocarbon pollutants are burned up in the hydrogen flame and converted to more benign CO<sub>2</sub> and water. The exhaust leaving the engine is cleaner than the air going in – minus emissions.

The function of an automotive air intake filter is to trap 10-20 micron abrasive particles like sand that cause the most wear inside the engine. Someone said allowing one teaspoon of dirt inside an engine would reduce engine life by 70,000 miles. The following list compares particle sizes.

1 micron = .00003937 inches  
1 micron = .001 millimeter  
A printed period is 625 microns.

Mostly trapped by a paper filter  
Pollen 10-100 microns  
Human hair 80 microns  
(Limit of visibility 40 microns)  
Mold spores 10-30 microns  
Car emissions 1-150 microns

Mostly pass through a paper filter into engine  
Paint spray 10 microns  
Industrial burning by-products, up to 2.5 microns

Diesel soot 0.1 micron  
Bacteria 0.1 micron  
Smoke 0.01-0.1 microns  
Tobacco smoke 0.01-4 microns  
Pesticides 0.001 microns  
Atmospheric dust 0.001-30 microns  
Viruses 0.005-0.3 microns

You can see that the more you drive with hydrogen, the more unhealthy nasties you're removing from our air.

### Thanks

Roy & Kathy- software and computer, rent donation.  
Drs. Munukuttla and Kannan for helping with the Hydrogen Economy.  
Ben- putting the car in carpool.  
Claude- carpool, meeting room  
Erik- Sharepoint  
Mike- paying for dinner.  
DK- technical books for library  
Tom- permission to use dynamometer

### Courage

“It is not the critic who counts, not the man who points out how the strong man stumbled or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiently; who errs and comes up short again and again; who knows the great enthusiasms; who knows the great devotions, and spends himself in a worthy cause; who knows in the end the triumph of high achievements; and who at the worst, if he fails, at least fails while daring greatly; so that his place shall never be with those cold and timid souls who know neither defeat nor victory.” (Theodore Roosevelt, April 10, 1899)

## AHA Membership Form

Name(s) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Country \_\_\_\_\_

Telephone \_\_\_\_\_ Email \_\_\_\_\_

- Regular Membership- \$39.00/year
  - New members receive a free copy of Roy McAlister's "Solar Hydrogen Civilization".
- Student & Senior (60 and over) Membership- \$25.00/year
- Sustaining Membership- \$100.00/year
- Corporation/Institutional Membership- \$1000/year
- "Solar Hydrogen Civilization" book only- \$24.95
- Email *Hydrogen Today* only

Print this form and mail with your check or money order to:

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P.O. Box 4205  
Mesa, AZ 85201  
USA

Or email payment to:

americanhydrogenassociation@gmail.com through [www.PayPal.com](http://www.PayPal.com)

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