
Hydrogen Today



Show Me the Hydrogen



ZEEP 24

Inside H2 Today

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The ZEEP (Zero Emission Power) System from Japan's FC-R&D is a self-contained, solar-powered, home-scale electrical generator. During the day, these small units generate and store hydrogen from electrolyzed rain-water. At night the hydrogen produces electricity from a fuel cell. Daily output is 500 liters of H₂ from 500cc of water; about 1.5kW. The ZEEP stores 1500 liters of hydrogen, enough for about 5 kWh. Their initial market is for off-the-grid and disaster areas. Watch their video at: <http://zeep24.com>

“Quotations”

“I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that.” (Thomas Edison, 1931)

“Thank God there are no free schools or printing; for learning has brought disobedience and heresy into the world and printing has divulged them. God keep us from both.” (Sir Wm. Berkeley, Gov. of Virginia, died 1677)

‘We Deliver Clean Air’

Hydrogen Today:
Journal of the American
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** SAFETY FIRST **

American Hydrogen Association Mission

Develop and prove solar hydrogen technologies that will eliminate economic, environmental and energy problems caused by burning one million years accumulation of fossil fuels every year *and*

Educate scientists, entrepreneurs and experimenters, parents and educators, CEO's, legislators, utilities, the media and farmers how to use solar hydrogen to create sustainable prosperity without pollution.

Here's the Deal

By Roy McAlister
President of the American Hydrogen Association

GRASSROOTS APPROACH TO PROSPERITY

Prosperity is the result of productivity. True prosperity produces a better environment. Ask prosperous persons what they are doing with their wealth. You will hear about their great cars, homes and travel plans that provide better surroundings for those that can afford to improve their environment. America needs more prosperous persons to devote their productivity and wealth to betterment of the environment. Peacefully producing clean renewable energy to replace the billion dollars that hemorrhage from the U.S. economy every week for foreign oil is enough wealth to create 1,000 new millionaires every week.

In too many ways, being hooked on oil is like being hooked on any other mind-altering drug. We rationalize our actions and pay virtually any price to keep the oil supply coming our way. We are willing to oblige our children to great debt to pay for our excesses. We stand armed and ready to go to war to assure delivery of foreign oil to fuel our *search for the good life*. Federal subsidies amounting to more than 60 billion dollars per year support wasteful practices of the utilities and fossil energy producers.

What we pay at the pump for gasoline and in our utility bills is only a fraction of the true price that we pay, including taxes to support these subsidies. Far more important than the spending of the special green paper called money, we are burning and spending carbon and radioactive resources that nature has stored safely away from the surface environment for millions of years. We pay with our health. Global combustion of 2,800 million tons of coal each year releases about 10,200 tons of carbon dioxide, 8,960 tons of thorium and 3,640 tons of uranium to the air, water and food chain.

Burning the equivalent of 180 million barrels of oil a day has increased atmospheric carbon dioxide 25 to 30% greater than at any time in the last 160,000 years. The increased carbon dioxide traps solar energy. Warming increases ocean evaporation and results in more extreme weather-related events such as floods, hurricanes and tornados.

Pollution of the atmosphere, drinking water and the oceans seriously threaten the standard of living achieved by the Industrial Revolution. Depletion of fossil fuels will ultimately cause economic inflation followed by hardships, increased sickness and starvation, along with strife and social disruption.

If we want a better world, we must make it so; one car, one backyard, one farm at a time. We can equip our cars, barbeques and engine generators to operate on both hydrogen and fossil fuels. If we convert our cars to run on renewable hydrogen, it will signal farmers that a hydrogen market exists.

Farmers seeking to become new millionaires are needed to supply hydrogen and carbon products along with the eggs, vegetables, milk, grain and cotton that sustain city dwellers. Hydrogen and carbon products can be new cash crops that are derived from biomass field wastes and manure that now rot into the atmosphere as greenhouse gas methane. The carbon can be used to make water filters, for reinforcing tennis rackets, bridges or airplanes with fibers that are stronger than steel and never rust, for diamond plating windshields and tools for longer life and to produce Fullerenes and Graphenes.

Cars operate more safely on hydrogen and clean the air as they are driven. Better than being zero-emission vehicles, our hydrogen cars can become minus-emission public service devices that exhaust cleaner air behind them than the air entering their engines. Airborne tire particles, diesel soot, carbon monoxide, hydrocarbons, peroxyacetylnitrate and other smog-forming pollutants are steam-cleaned from the air by 4,000°F lean, stratified-charge hydrogen combustion in the engine. An average car using hydrogen can clean enough air in a day to fill two to five houses with clean air. Feel good about driving your car while you clean the air for your community and support your local economy .

Hydrogen on the Internet

If you have a big budget, The Hydrogen Company in Minneapolis will provide you with a C30 Micro Turbine that might run on hydrogen, H2 leak and flame detectors, hydrogen purity analyzers or fuel cells from 12 to 5k watts. <http://www.thehydrogencompany.com>

Be the first on your street to own a 536 horsepower hydrogen fuel cell electric-drive Tyrano semi-truck. Top speed governed to 65 MPH. Lithium batteries, 200 mile range (400 miles with extended option) and 4 to 7 minutes refuel time. <http://visionmotorcorp.com/tyrano.asp>

Legitimate nonprofits can get donated software from Techsoup by paying only a small administration fee. For example, Microsoft Office Pro is \$30, Adobe Dreamweaver is \$35 and Norton, Quickbooks, Cisco routers and refurbished laptops are also available. There are various restrictions. Techsoup also has excellent webinars and online tutorials on various nonprofit matters, such as fundraising, social media, donations and membership management, volunteer and event management, Internet security, Internet telephone and website design. <http://home.techsoup.org/pages/default.aspx>

The Dirigio, a homemade wooden car from Maine that only gets 99 miles per gallon. <http://gas2.org/2011/09/21/project-spotlight-dirigo-the-homemade-99-mpg-car>

Smartphone meets the microscope. Johan Lundin, an M.D. in Finland, invented a microscope that sends images across the Internet to touch-screen viewers that can enlarge 1000 times. This tool could allow a doctor or researcher to save your life someday. This webpage has a short video of the 'scope in action: <http://www.forbes.com/sites/jenniferhicks/2011/06/26/the-socialization-of-microscopes>

Editorial

Someone asks me every day what I do in the AHA. Well, I get dirty a lot. I go to meetings and I have to visit the hardware store twice a week. But that's not it. I learn continuously from some of the brightest people in Arizona and I make many new friends. I reconcile the AHA checking account. But that's not it either. I heard a woman on the radio explaining how hard it was to tell her 10-year old son that he wouldn't be getting his allowance anymore because the BP oil spill wiped out their fishing livelihood. I remember being 10 years old once. On the TV, I see Haitians and Japanese and Joplin, Missouri Americans searching the rubble trying to figure out where their homes used to stand and what they're going to do. I read in the newspaper about the rescued coal miners and about the lost coal miners. How many of the million people a year who die from air pollution could have become a Mozart or a Thomas Edison or a Mark Twain or a Lincoln? What do you do when fracking makes your tap water flammable? Oh yes, I mustn't forget my teenage friend who burned to death in a gasoline fire. So maybe nobody else cares, but I'm going to do something about these things. My call is to build the Hydrogen Economy. And so I get dirty and go to the hardware store.

I went to the Burning Man Art Festival in Nevada with some fellow AHA'ers. I was the chef and chief bicycle mechanic. It was amazing to see the ingenuity brought forth to create a two-mile wide city of 54,000 people in the desert for a week with no water, electricity or motor transportation. Of course, there were photovoltaic panels galore and LED lights, solar ovens, solar refrigerators, solar showers, hybrid bicycles and bicycle-powered can crushers. Warren and Rick designed and built a miniature water-treatment plant to recycle greywater. Watch this video if you want to get an idea of the madness that is Burning Man. Crank it up! <http://www.youtube.com/watch?NR=1&v=0jm1PMU6jLk>

Recently I had the pleasure of touring the Milagro Community near Tucson and sat down with many people active in alternative energy in what turned out to be a five-hour conference. With a million other people around the world doing the same thing, nothing can stop us from our mission.

The latest recipients of the AHA's Diamond Green award go to Faren Dancer, Lainey Dancer and Maxine Swisa for constructing their green Emerald Home in Santa Fe, NM. Local recycled wood, glass and stone were used instead of toxic materials. High thermal-mass Compressed Earth Blocks were made from on-site soil and insulation was made from newspapers. A geothermal heat pump, 9kW of PV, OASys low-humidity evaporative coolers and daylighting Solatubes reduces energy 102% over a benchmark house. Three 1700 gallon rain-water cisterns capture 80% of the run-off. Some of the water supplies a drip-irrigation system. They worked with the city to write new building code as the house was built. Mr. Dancer used the project to develop a zero-energy housing course for the community college. <http://www.theemeraldhomesantafe.com>

Next time we'll have MPG results for some on-board HOH generators, consider the pros and cons of solar PV leasing and visit Heat Sync Labs in Mesa, AZ.

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.

Arizona State University Nonprofit Volunteer Fair, October 4th, 10 AM to 2 PM on the Hayden lawn, Tempe campus. The AHA will have a booth there.

The City of Scottsdale, Arizona sponsors free monthly lectures on solar and green building at the Granite Reef Senior Center at 1700 N. Granite Reef (NW Granite Reef/McDowell). Local experts cover solar hot water, cooling in the desert, clean fuels, rain harvesting & greywater and much more. For the schedule see: <http://www.scottsdaleaz.gov/greenbuilding>

The theme for the 8th annual Hydrogen Education Foundation's Hydrogen Student Design Contest is "Design a Combined Heat, Power and Hydrogen System for a University Campus Using Local Resources." Last year 47 university teams from 17 countries competed. Winners will receive an expense-paid trip to the 2012 National Hydrogen Association Conference in Toronto. <http://www.hydrogencontest.org/index.asp>

Arizona 2011 Valley of the Sun Self-guided Solar Home Tour, Phoenix, Arizona, October 22-23 from 8 AM. Other national tours are scheduled for October 1st. <http://www.azsolarcenter.org>

The sequel to "Who Killed the Electric Car" is on the way. Revenge of the Electric Car opens in Scottsdale on November 4th. For other cities see: <http://www.revengeoftheelectriccar.com/screening-dates.html>

Tucson Citizens for Solar have been holding their Solar Potluck and Exhibition for three decades. Bring your oven or a salad or fruit to share and enjoy a day of music, seminars and solar demonstrations. Catalina State Park, April 28, 2012. <http://citizensforsolar.org>

Books & Publications

Hydrogen - Hot Stuff::Cool Science, Rex Ewing, 2007.
PixyJack Press, \$19, 288 pages.

This tale starts out with the author being thrown by a horse and coming to near a mysterious walled farm in Colorado where he learns to speak 'hydrogen'. You will too. Zed the wizard will lead you through a thorough study of hydrogen science and issues. As a textbook, the plot may be a distraction. On the other hand, it might be the sugar that helps the medicine go down.

Teaching as a Subversive Activity, Postman and Weingartner, 1969.
Dell, \$15, 219 pages.

This 1969 classic is required reading for every school teacher in this country, before it's too late. You better hope the kids don't read it. The authors claim the purpose of education is "crap detection."

Power to the People - How the Coming Energy Revolution Will Transform an Industry, Change our lives and Maybe Even Save the Planet., Vijay Vaitheeswaran, 2003.
Farrar, Straus and Giroux, \$6.40, 358 pages.

Vaitheeswaran is the environmental and energy correspondent for the "Economist," who happens to have a mechanical engineering degree from MIT. He sets the pace with his second sentence: "The needlessly filthy and inefficient way we use energy is the single most destructive thing we do to the environment." He dismisses Keep Pumping and Ride Your Bicycle as long-term energy solutions. He calls global warming "global weirding." We cannot now prove that climate change is man-caused, but do we want to get shot by someone aiming a gun at us as proof before we do anything?

Putting Windows on almost every computer in the world made Bill Gates the richest man in the country. Filling the gasoline tank of every car in the world, quite an accomplishment, gets you condemned. In Hofmeister's book reviewed last time, he claimed that the oil companies hate each other so much and are so scared of price-fixing charges that they won't collaborate on prices.

Much of Mr. V.'s book is about his solutions, not his criticisms. He believes the hydrogen economy is inevitable. Like the petroleum revolution, we'll get there with entrepreneurship, ingenuity and inspiration, and not by government hand-outs. Government regulations need competent analysis to see if they make any sense or impede real progress. He says that nuclear power is too expensive and that the social and environmental damage of large hydropower projects is unacceptable. He favors micropower; small, efficient, distributed turbine generators. He points out that the power generation capacity under the hoods of U.S. cars is ten times that of all coal, nuclear and natural gas plants. He'd like to use that resource and eventually convert all vehicles to fuel cells.

The Third Industrial Revolution: How Lateral Power is Transforming Energy, the Economy and the World, Jeremy Rifkin, September 27, 2011.
Palgrave MacMillan, \$15, 304 pages.

I just finished reading "The Third Industrial Revolution" by Jeremy Rifkin. His five pillar plan to save society and the planet and make a generation of jobs by basing the world economy on renewable energy rings true.

1. All energy comes from renewable sources (non carbon or carbon neutral).
2. Every building is turned into a mini power plant with solar or wind.
3. All these power sources are interconnected by a new intergrid, based on internet type technology so that all those micro power plants can fill:
 - A) their own needs
 - B) the requirements of their local neighbors
 - C) the requirements of their local area
 - D) the requirements of the region
 - E) the requirements of the country
 - F) the requirements of the continent. Even intercontinental as plans for power lines- Africa to Europe, US to Russia and ASEAN interconnect, are underway. Energy would ship in packets just like internet information and go to where it was most needed. All the micro power plants would get paid for their excess power.
4. Every micro power plant would have a storage capacity based on HYDROGEN or other means.

5. All transportation would be battery electric or fuel cell electric. These vehicles would also be micro power plants, hooked to the intergrid, sucking up power when it was cheap and selling it back to the intergrid when demand was high. Collectively the vehicles would have and hold more power than all the fixed power plants in the country which would mean that eventually we could shut them down..

These five steps will level society in a million ways enabling a cooperative instead of a dominative society based on who controls the power source, coal mines, oil and gas fields and who has the military clout to defend them and allowing for true democratic freedom. Without your own power you are powerless. I'm hearing of offers from China for containers of solar panels at \$1.50 per watt!

I suggest that AHA become one of the greatest boosters of the "Third Industrial Revolution" and be a source of information that tells people how to understand how the five pillars interact and reinforce each other and how it can lead to true "Prosperity without Pollution"

John Gotthold - President
AHA Silicon Valley Chapter



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
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- The Battery Builder's Guide....\$16.95

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

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Thanks

MaryLou- delicious brunch and Milagro Community tour, Sam B.- presentation on the Tucson Tortolita Eco Village, Warren & Rick- BM shower, Jason- tour of Heat Sync Labs, Byron- 15 years of webmastering.

AHA Membership Form

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- Regular Membership- \$39.00/year
 - New members receive a free copy of Roy McAlister's "Solar Hydrogen Civilization".
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