

Hydrogen Today

"Clean Energy for a Clean World"

Official Publication of the AHA

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DOE Options for CO₂ Reductions

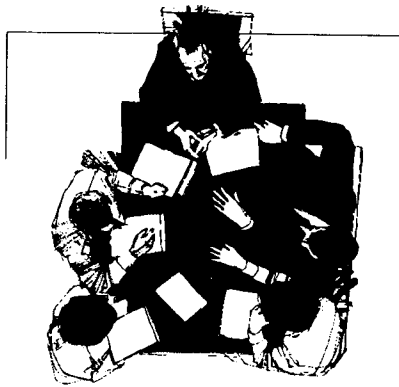
A recently-released U.S. Department of Energy (DOE) study indicates that an effort to achieve dramatic reductions in carbon dioxide (CO₂) emissions could require substantially increased taxes on gasoline and other fuels with severe economic consequences.

"This study," observed U.S. Secretary of Energy James D. Watkins, "points out the very high costs to our economy of the large carbon dioxide reductions some are advocating. Given these high costs, given the uncertain state of our knowledge about how greenhouse gases affect global climate change, and given the limited effect that action by any one nation can have on global greenhouse gas emissions, arbitrary emission reduction targets such as those studied here are clearly unwarranted."

The DOE study responds to a request from Congress for an analysis of options that would cap national carbon dioxide emissions at 20 percent below recent levels by the year 2000 and 50 percent below recent levels by 2010.

According to the report, capping CO₂ emissions at 20 percent of 1990 levels would cost \$95 billion a year in the year 2000 and would require a tax rate of \$500 per metric ton of carbon, which would more than double the price of gasoline. At tax rate in excess of \$750 per metric ton of carbon would be required to achieve a 50 percent reduction in CO₂ by even the year 2030.

A \$500 per ton carbon tax would increase the price of gasoline by \$1.30 per gallon, the price of heating oil by \$1.45 per gallon,



and the cost of crude oil and wellhead natural gas by 350 percent and 400 percent, respectively.

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Upcoming Events

Public Citizen and AHA Launch Sun Day 1992

The American Hydrogen Association joins Public Citizen (a group founded in 1971 by consumer advocate Ralph Nader) in launching Sun Day 1992. As a sponsoring organization, AHA is advocating a national energy policy that reduces total energy use by 10% and triples the current contribution of renewable energy technologies by the year 2010. Meeting these goals would enable the U.S. to reduce emissions of carbon dioxide, the primary global-warming gas, by at least 20-25%.

Activities will be initiated by individual citizens and local and state-level groups rather than as a centrally-directed and -managed program. AHA will encourage, support, and launch on-going educational, media, and other activities before, during, and after the focus day of April 22, 1992.

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Renewable Energy and Bioreserves in South America

By Dr. Donovan L. Waugh, Fuego Rey Forestation Projects

The highly developed countries of the world contribute most of the pollution that threatens global sustainability of natural and human resources; but it is the Third World that can play a key role in reversing this global environmental deterioration. Recognizing this, the American Hydrogen Association is actively working to establish a partnership with the Fuego Rey Forestation Project to develop biofuel and food ecosystems in South America.

This concept has been proposed by Fuego Rey International, S.A., with headquarters in South America. Under this innovative approach, natural resource preservation and energy development are truly compatible, rather than being in competition with each other. Economic, social, and ecological objectives are all integrated into a new ecosystem that is truly sustainable and beneficial to native inhabitants, governments, and to the global environment.



Integrated Bioenergy Community

Biofuel and food ecosystems represent a sustainable means of bringing about production of food and bioenergy, utilizing the development of Integrated Bioenergy Communities as buffer zones surrounding important core areas of Bioreserves. The bioreserves themselves are owned by individuals, ecology groups, governments, or any other agency willing to provide funding to purchase these natural resource sanctuaries. The core areas of these bioreserves are home base for indigenous Native American Indian Tribes that wish to continue their traditional life style of hunting and gathering. Protection and management of the core bioreserves is aided by the buffer zones that surround them. It is in these zones that integrated community development activity takes place.

Biomass would be the primary "crop" in these zones, supplying feedstock for production of clean biofuels such as ethanol and (preferably) hydrogen. The types of biomass to be utilized in this project are of ligno-cellulosic origin. These types of biomass are ecologically adapted to the area and do not require pesticides for sustainable production.

Economic As Well As Environmental Boost

The biocenter in each community will provide employment for a wide cross-section of human resources. It is here that the biomass crops are processed into fuels and important by-products such as protein. Additional food production is achieved by intensive gardening and livestock/poultry/fish farming that utilize by-products from the biofuel processing.

The major source of income for the community is the sale of energy and other forms of harvested carbon, which not only supplies the population with a sustainable economic base but also helps to recycle the carbon dioxide that contributes to global warming.

Prototype projects of Biofuel and Food Ecosystems are on the drawing boards for Paraguay, which already has an aggressive clean energy program in progress. Paraguay is targeting to become self-sustaining in clean, renewable energy, using biofuels and hydroelectric power. The natural conditions of this country, however, readily permit production of exportable surpluses of clean bio-energy. In addition, some fifteen native Indian tribes would be permanently settled in the major bioreserves already in existence or being set up; and thousands of rural colonists, currently very poor, will be settled near the biocenters surrounding the bioreserves and given jobs and new economic growth opportunities.

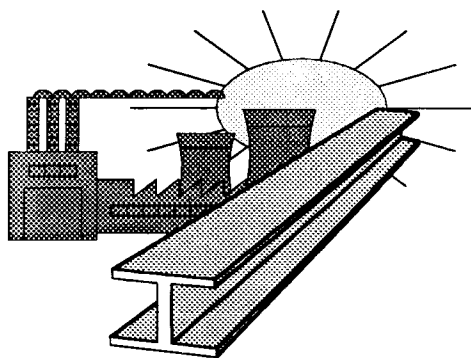
Template for Other Third World Countries

Engineers in Paraguay are very excited about this pilot program. It provides a template for a major solution to several problems facing the world today. It truly is a worthy project for the American Hydrogen Association to become involved in.

We welcome AHA's support and look forward to working together in whatever ways we can.

Using Hydrogen for Steel Production Could Reduce Global CO₂ Emissions by 10%

By Herb Hayden, P.E



Renewable hydrogen could replace coal or other fossil fuels in the production of steel from iron ore, according to a recent paper by J. Gretz, W. Korf, and R. Lyons in the *International Journal of Hydrogen Energy*. The energy-intensive steel industry, using fossil fuels, produces more than two pounds of carbon dioxide gas emissions for every pound of steel made. Worldwide steel production accounts for about 10% of all CO₂ emissions produced by the burning of fossil fuels.

Hydrogen, when produced on a large scale from renewable resources such as hydropower, solar, and wind energy, can replace coal and other fossil fuels in steel-making processes and essentially eliminate the undesired CO₂ and other fossil fuel by-product emissions. Instead, the emissions from a hydrogen-based steel plant would simply be water vapor.

In conventional processes, iron ore, which is rich in iron oxides — or iron-oxygen chemical compounds — is reacted with the carbon in coal and other fossil fuels. The carbon combines with the oxygen from the ore, leaving metallic iron. When hydrogen is used instead of carbon, the same type of chemical reaction takes place, except that only water vapor results from the combining of hydrogen and oxygen.

For the steel-making application, hydrogen produced from hydropower may become competitive with coal in direct operating costs, especially when the costs of removing sulfur and other contaminants from the coal are considered. In addition, the production of hydrogen from water produces pure oxygen, which is a valuable by-product needed in the steel smelting furnaces.

The report in the *Journal* notes that newer coal-based steel-making processes are being developed that are more energy efficient; at best, however, these efficiency improvements will not meet the projected growth in the steel industry without increasing CO₂ emissions.

Hydrogen could be shipped in or produced at the steel plant, using solar-generated electricity or other renewable resources. The hydrogen would be stored and replenished at times and in ways that take maximum advantage of the economics of energy supply and demand. For example, intermittent energy resources such as solar and wind energy could be used whenever available. To support a continuous around-the-clock steel production, these resources could be augmented with the use of off-peak electric power purchased from utilities on a wholesale, interruptible basis that is substantially lower-priced than peak-demand electric power.

According to the *Journal* report, about 35% of the world's operating hydroelectric capacity is currently unused, and therefore is available for off-peak hydrogen production immediately.

The report also reveals that the share of global steel production by North America has declined from 18.7% in 1979 to 13% in 1987. Similar declines have occurred in Western Europe and Japan, as production has moved to developing countries and to those with centrally-planned economies. Concerns about industrial emissions in the U.S. could accelerate this trend, but the use of non-polluting hydrogen from renewable resources could help reverse the trend. Conceivably, once hydrogen is fully introduced, steel-making might be considered a clean industry and lose its unpleasant label of "smokestack industry."

(Ed. Note: This report is based upon "Hydrogen in the Steel Industry", published in the International Journal of Hydrogen Energy, Vol. 16, No. 10, 1991. The authors are J. Gretz, of the Joint Research Center, Commission of the European Communities, Italy; W. Korf, of Korf Lurgi Stahl Engineering, Germany; and R. Lyons, of Industrial Consultants International, Ltd., Ireland. For copies of the article, contact the IAHE at P.O. Box 248266, Coral Gables, FL 33124.)

Sun Day 1992 Launched

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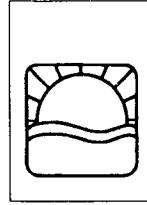
Statement of Principles and Goals

Global climate change, oil spills, air pollution, acid rain, radioactive emissions and waste, rising oil imports, and other energy-related environmental and economic problems continue to worsen, threatening major, worldwide impacts. Our nation's energy strategy must, therefore, begin now to shape and manage a transition to a sustainable energy future that assures a safe, clean, affordable, adequate, and independent energy supply.

National surveys confirm that the American people overwhelmingly believe that such a strategy should be based primarily on efficient energy use and renewable energy supplies, rather than on conventional fossil fuel and nuclear power energy sources.

National energy policy-makers, however, have thus far failed to implement such a strategy. From this failure comes the need for a national "grassroots" campaign for an energy policy that embodies the following principles:

1. The U.S. must give priority to those energy options that maximize benefits such as environmental protection, local economic development, regional self-sufficiency, and job creation; while minimizing economic, environmental, and social costs.
2. The U.S. must avoid energy technologies that are particularly hazardous to human health or to the local and global environment.
3. The U.S. must minimize the use of energy imports in order to avoid economic disruptions and to protect national security and the economy.



DRAMATIC EXPANSION OF RENEWABLE ENERGY MARKET IN MEXICO

Mexico — the largest single export market for U.S. photovoltaic (PV) producers — is on the verge of a dramatic expansion of renewable energy use in rural areas. Since 1989, Mexico has installed nearly 10,000 solar PV systems for lighting, water pumping, refrigeration, and other applications in isolated villages.

Asked if extensive use of small PV systems mean Mexico is on the verge of becoming a "huge" renewable energy market, Chris Rovero of Oak Ridge Associated Universities responded that there is no such thing anywhere in the world, but Mexico has become the best market. The Mexican government plans to fund the program \$30 million in the coming year, with larger support each year following.

What Mexico needs to carry out an expanded program is training of personnel and technical assistance for village-centralized systems. Assistance will be most valuable in those areas where Mexico has little experience, such as wind power or hydrogen-generation.

Mexico has little choice but to expand its renewable energy program, since rural areas are making greater demands for energy, and it is inefficient to connect them to main power grids.

The U.S. government is urged to provide additional support for this program, according to Rovero. "What the U.S. gets from helping Mexico is the prospect of expansion of the renewable market in other developing countries, assuming the example in Mexico is a good one." Rovero notes, however, that "if renewable energy fails in Mexico, it could have the opposite effect, so it is to the advantage of the U.S. to see that renewable energy succeeds."

Earthfest '92 to Showcase Innovations

"EarthFest '92", the largest environmental exposition in Arizona, is scheduled for the weekend of April 25-26 in Scottsdale. The event is an annual celebration of Earth Day. Last year's event featured some 140 exhibits and drew more than 22,000 visitors. (AHA was one of those exhibits.)

The event is sponsored by Valley Forward Association and will showcase the latest innovations in environmental products, services, and technology, including solar displays and conservation tips for consumers. "The entire program will be geared to increasing our awareness of environmental issues while promoting practical, sensible solutions," ac-

ording to Valley Forward President Diane Brossart.

AHA is planning on participating at this year's event, with an exhibit featuring both solar hydrogen production and the use of hydrogen in specially-converted vehicles.

The event will take place at the new Scottsdale Municipal Stadium, located in downtown Scottsdale, AZ. It will be held from 11 AM to 5 PM both days.

Valley Forward Association is a 23-year-old non-profit public interest group that supports aesthetic, cultural, and environmental improvements throughout the Greater Phoenix area.

New Federal Energy Legislation Passes

"Hydrogen Research, Development, and Demonstration Program"

Late last year, the 101st Congress approved the "Hydrogen Research, Development, and Demonstration Program", providing R&D funding on hydrogen totalling \$20 million over three years. Although this funding level was less than the bill's original sponsors had hoped for, the approval of the program at least raises the visibility of hydrogen in the U.S. The act addresses only research areas that are assigned to the U.S. Department of Energy (DOE).

According to New Jersey Representative R. A. Coe, the new bill "is part of the effort to develop a long-overdue energy policy for the nation. The legislation at hand establishes a coordinated national research and development program to find less expensive methods to produce hydrogen for alternate clean fuel supply. The timing is extremely important. Recent events have highlighted the vulnerability of America's energy supplies, particularly with regard to liquid transportation fuels."

Luz International Files for Bankruptcy

Luz International, developer of large solar plants, filed for bankruptcy in Los Angeles federal court and blamed the tentative nature of U.S. government support for its demise.

Luz began building commercial solar energy plants 10 years ago. "Today there are nine privately-financed power plants producing 354 megawatts of electricity from the sun, enough to meet the residential needs of over a half-million Southern Californians," reports Luz Chairman Newton Becker. "As businessmen and engineers, we proved it could be done, but lawmakers and bureaucrats in Sacramento (CA) and Washington DC kept changing their minds about the importance of solar energy."

DOE Refutes Charges

Energy Secretary Henson Moore responded to Becker's charges by calling the future of solar energy "promising" and noting that the solar energy research facility has been elevated by President Bush to the status of a national laboratory. Renewable energy research and development funding has increased 73 percent, according to Moore.

"Although I am disappointed at the business failure of Luz International," said Moore, "it does not detract from what the firm has accomplished. Luz blazed a trail in solar energy development that will be useful for many years to come. DOE remains dedicated to supporting the development of a fully-competitive solar power industry." Pointing to massive investments of U.S. trading partners in emerging energy companies, Becker asked, "Do you really think that this type of thing would happen in Japan or Europe? Or wouldn't they support a strategic industry consistently until the time it could compete effectively in the world market?"

"National Energy Security Act of 1992"

Frequently referred to as the Johnston-Wallop energy bill, the National Energy Security Act of 1992" (SB 2166) was formally passed February 19, 1992. This act is intended to reduce the nation's dependence on imported oil, to provide for the energy security of the nation, and for "other purposes."

This extensive piece of legislation (the bill is 401 pages long) covers a wide spectrum of energy topics, ranging from fleets and alternative fuels and renewable energy to advanced nuclear reactor commercialization and coal, coal technology, and electricity. The word "hydrogen" is even referred to in passing a couple of times.

The bill had been vigorously opposed by the U.S. Public Interest Research Group. According to a handout prepared by this group in late January, "The Johnston-Wallop energy bill ... [is a] package of handouts to the large energy companies. ... In order to make his bill look more "balanced", Senator Johnston has removed a few of its many backward provisions, weakening the Clean Air Act, and offering a no-teeth gas mileage standard."

Copies of the massive and confusing legislation are available through your local Senator's or Representative's office, and a copy is on hand at the AHA headquarters. (Because of the bulkiness of this material, it is not possible for AHA to send out xerox copies.)

Sustainable Energy Transition Proposed

Senator Paul D. Wellstone of Minnesota introduced a new bill in the Senate last November with the goal of tripling the production of energy from renewable resources.

"This legislation would establish a multibillion dollar trust fund to support sustainable energy transition efforts, developed by the States with Federal support and guidance. The objective would be serious and innovative programs in each of the 50 States aimed at a 20 year goal of reducing energy use by at least 10% and tripling renewable energy production."

The new bill proposes to fund these efforts by repealing the passive loss exemption to the alternative minimum tax, for \$300 million per year, and phasing out the depletion allowance for oil, gas, and coal, for \$1.2 billion per year, and establishing an excise "carbon-based" tax on the production or importation on coal, oil, and natural gas for \$4.2 billion per year.

"When phased in over three years, the small carbon-based tax would amount to roughly one-half penny per gallon of oil," according to Wellstone.

Senator Wellstone credits energy, environmental, taxpayer and consumer organizations for the formulation of what he considers to be a fundamentally new approach to national energy policy.

Inside The AHA...

New York State Reader "Plugs" Hydrogen In Local Newspaper

Dear Editor:

My copy of Hydrogen Today arrived today... and stimulated me to send another letter to the local paper plugging hydrogen technology. I enclose a copy of the body, which is, of course, based on the piece by Irv Jorgenson/Roy McAlister in your newsletter.

Since we have just elected an environmentally-aware mayor in our neighboring city, Jamestown, I have been urging her to seek an arrangement with the nearby Cummins Diesel plant to produce methane-burning engines for use in city and county vehicles ... as a first step to shifting to hydrogen. This is an area rich in natural gas, so much so it can be an embarrassment when it gets into water wells. So methane to hydrogen seems a logical jump.

[In the attached write-up is the following observation:] "Internationally, hydrogen is the power of the future, but here in the United

States, hydrogen experiments are starved for seed money. ... Even the Saudi Arabians are experimenting in converting their boundless sunlight to hydrogen. Yet our President George "Big Oil" Bush is much less concerned with our welfare than he is with international oil profits. What as pity that the non-polluting energy experiments begun in the Carter Administration were cut off at the pockets by the Reagan/Bush regime."

Yours Truly,

Wayne J. Anderson
Frewsburg, New York

Dear Wayne:

Thanks for helping spread the word about clean-burning fuels. Your observations about Administration support for alternative energy are shared, however, by many; and that perception may have an impact on the upcoming Presidential elections; who knows? The case for hydrogen, however, should not be a partisan issue; it just makes immensely good sense for us all. Let your leaders know what you think.

- Editor

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LETTERS POLICY

Hydrogen Today welcomes all letters to the editor.

Letters should include your name, address, and a telephone number where you can be contacted.

All letters are subject to editing. Address letters to:

Letters to the Editor
219 S. Siesta Ln., Ste. 101
Tempe, AZ 85281



"Thanks To AHA"

Mr. Irv Jorgenson
American Hydrogen Association

Dear Mr. Jorgenson:

The recent Energy Fair held at Williams Air Force Base on November 16, 1991, was a big success because of your participation.

We could not have had the impact on our base residents in terms of education that we did without your dynamic and informative display. ... The fair was one of the most important events we could offer our people this year in a time of dwindling natural resources.

Our generation of younger airmen in particular needs to hear the message you have to offer.

We appreciate the time you took from your busy schedule to make this Energy Fair a worthwhile event.

My thanks to you for a great day.

Sincerely,

Kurt B. Anderson
Colonel, USAF
Commander
Williams Air Force Base AZ

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Would Hydrogen Have Prevented the Natural Gas Explosions in Chicago?

Dear Editor:

In today's "L.A. Times" was a report of a tragic natural gas explosion that "rocked eight square blocks of homes and factories near Chicago's Loop on Friday [Jan. 17, 1992], triggering 18 fires, blanketing the central city in a thick, smoky haze and leaving hundreds temporarily homeless on a bitterly cold night. One person was killed, two others were reported missing and five were injured.... Witnesses described the scene as like a war zone."

After seeing the article, I immediately thought of hydrogen and the AHA. It would seem that the catastrophe described would be highly unlikely to happen were we using hydrogen to heat our houses rather than heavier hydrocarbon gases that can accumulate and be ignited by the flames from gas water heaters or other appliances. I would imagine that hydrogen, being so light, would disperse almost immediately and not tend to build up to explosive concentrations.

If you agree with my assessment, perhaps one of your staffers could research this phenomenon and write an article on it — as one more brick in the wall of supporting evidence in favor of hydrogen as the fuel of choice. At any rate, I am a big fan of hydrogen technology and your important efforts in the American Hydrogen Association. Keep up your wonderful work, and best wishes for success in this New Year — for all of us.

Kindest Regards,
Michael Klaper, M.D.
Maui, Hawaii

Dear Dr. Klaper:

Thank you for your support and kind wishes. The relative safety of hydrogen versus other "conventional" fuels is indeed an important topic. There are, of course, a number of factors to consider: it is not quite as simple as you suggest.

The reported cause of the tragic accident was a failure of a system pressure regulator which caused a surge of fuel through household appliances. The relative density of the fuels is but one factor. Perhaps the most important one, though, in this situation, is venting. If these homes and factories were heated by hydrogen but vented, so any leaking hydrogen were allowed to dissipate rapidly to the atmosphere, your conclusion would likely be correct.

Perhaps, however, if the natural gas had been vented to the outside air, there also would not have been such a catastrophe. Hydrogen does, however, have the advantage of being much lighter and much smaller in molecular size than methane (natural gas). It, therefore, would more easily dissipate from even a poorly ventilated space.

- Editor

DOE Study

Continued from Page 1

The size of the U.S. economy would be reduced by 1.4 percent in 2000, according to the study. This would result in substantial sectoral shifts in employment, with particularly acute losses in employment in the coal industry.

Copies of this report are available from the Department of Energy's Office of Public Affairs, Room 1E-206, Washington DC 20585.

Editor's Response

Ed. Note: Jim, Jim, Jim. You're way off base. First of all: how much do we have to know about the effect of greenhouse gases on global climate conditions before we decide we have a problem; do we have to wait until Earth becomes another Venus? Secondly: the U.S. contributes a widely disproportionate share of the total man-made greenhouse gas emissions; our effect on the problem is by no means limited. How can you suggest, then, that any actions by the U.S. to reduce the problem would only have a very limited effect? Next, your study concludes that there may be a high cost to the economy by trying to control CO₂ emissions (a fact that might well be disputed); but what about the cost of moving to a different planet? These are, we suspect, even higher, even if we were only to try to save a few percent of the world's population. Finally, what's with this carbon tax bit? Is it your belief that the only way to reduce the production of CO₂ is to tax the Heck out of carbon? Well, that might be one way to get the world to move to Hydrogen!

More Inside The AHA. . .

To The Editor of The "Arizona Republic":

Dear Editor:

Is there a key problem, that were we to recognize it, that the solving of which would unravel many of the other issues that we are concerned about in this election year? Consider this: our prosperity is dependent on the oil that we use to run our transportation infrastructure. We can no longer supply the amount of domestic oil required to fuel our cars and trucks, busses and planes. We have, in other words, become dependent on a supply of foreign oil for our prosperity.

We cannot remain a great and prosperous nation if we are dependent on a commodity in which over 80% of the world's supply is controlled by the leaders of a few small countries (the so-called members of O.P.E.C.). We have known this since 1973 but tend to forget it as soon as a crisis passes. Two-thirds of our trade deficit can be accounted for in imported oil. Oil is a product that has a diminishing supply and an increasing demand in the world. Oil is a major cause of pollution, which is a major cause of health problems.

The U.S. now consumes 25% of all the oil produced in the world. If we continue to rely on it, we will continue to fight wars over it. Regardless of what its price is now, it will inevitably become more expensive in the future. Our country must become energy-independent to ensure its status as a great and prosperous nation. And the world must have an increasing supply of energy if it is to prosper.

What the world needs most is a renewable, pollution-free fuel to insure a prosperous and healthy future.

The challenge of the U.S. is to design and build an infrastructure based on such a fuel, one that is not dependent on fossil fuels that are dwindling in supply and pollute our land and air and water.

This infrastructure and fuel production regime would create thousands of good jobs that will challenge and stretch the abilities of everyone. It will create new income and with that, more tax revenues to help pay down the massive budget deficit. It will reduce the exporting of our dollars and stimulate the purchase of American-produced energy throughout the world, turning around our balance of payments. It will provide the means for having a "good life" without having to poison our environment.

We do not need to accept the idea that the situation is hopeless; and that our children will have to settle for less than we have enjoyed.

It is the President's job to set the agenda for the United States. What I want to hear from the candidates in the coming election is their agenda for solving this problem. (A big hint to them all: Consider Clean, Renewable Hydrogen.)

Charles H. Terrey
Phoenix, Arizona

Dear Chuck:

Thanks for the suggestion. Hydrogen Today is compiling positions from the leading candidates on energy and environmental issues. Look for an article in the next issue.

— Editor.

To The Readers' Forum Department of Jamestown "Post-Journal":

An environmental scam to rob Peter to pay Paul was disclosed by Germany's paper, Die Zeit. The Canadian James Bay II "Hydro-Quebec Electric Project" is being backed by German interests. They scheme to use electricity to produce hydrogen that will then be shipped in liquid form from Quebec to Hamburg, Germany.

Germany is very conscious of air pollution. The German people will no longer hold still for more [environmentally-risky] nuclear power plants. They are aggrieved by breathing chemical soup. Daimler-Benz and BMW are planning to introduce virtually non-polluting hydrogen-powered busses in Hamburg and Stuttgart as a starter.

Hydrogen may solve Germany's pollution problems ... but at the cost of a genocidal plan to put nearly 10,000 square miles of Native American land in Canada underwater. Mercury and cesium leached from the submerged rock will, environmentalists fear, make fish from James Bay watershed inedible.

Europe has a much better solution available if it will use it. The vast sunny areas around the Mediterranean and the Red Sea could be planted with state-of-the-art solar generators that could electrolyze water into hydrogen and oxygen as easily and, likely, more cheaply than the Canadian hydroelectric dams. The hydrogen could be pipelined through existing natural

gas lines connecting most major cities of Europe.

Wayne Anderson
Frewsburg, New York

Dear Wayne:

My! Two letters in one issue of Hydrogen Today! Can I interest you in a job as staff writer or editor? Thanks for bringing to our attention a "shady side" of a much-publicized program to produce commercial quantities of hydrogen. Even though hydrogen is a great solution to a multitude of world problems, it, too, must be carefully implemented.

— Editor.

The views expressed on these pages are those of the author and do not necessarily reflect the views of the Hydrogen Association or AHA. Opposing views are welcome.

To Congressmen Jon Kyl (R. - AZ):

Dear Jon:

It appears that a major problem facing our country today is that we have no economic direction or specific national goals, and we have lost our dominant position in most economic areas. The emergence of the European Common Market and an economically-unified Europe will and is already starting to provide major competition to traditional U.S. industry and our markets in Europe. The recent downsizing of General Motors is a profound acknowledgement of our loss of dominance in the auto industry (we have already lost most electronic industries); and, most recently, the disintegration of the U.S.S.R. has drastically limited the future potential of one of our last remaining areas of major export business: defense. Where do we go from here? That is what many people in our country are asking.

I believe the one major area left to assert our dominance is in the field of energy. Moreover, setting a major national goal of having hydrogen as a major fuel of the future is the kind of program that can give new economic excitement, enthusiasm, and direction to our country. Because of the almost limitless supply of hydrogen, this is a goal which is even more dramatic than building a tunnel from France to England or sending a man to the moon; yet it is probably cheaper to accomplish and would yield far more rewards both economically and socially.

The time to announce such a goal is right now, while the world is still stunned from recent political events, and while our country is quickly turning its eyes from those political events towards our own economic recession. I would envision a quasi-governmental corporation to be set up, with a "blue ribbon" board of directors, made up primarily of the captains of private industry. The basic goal of this corporation would be to coordinate and implement the development of energy technology as a major American product line, to emphasize the development of hydrogen, and to consider the development of other alternative energy sources.

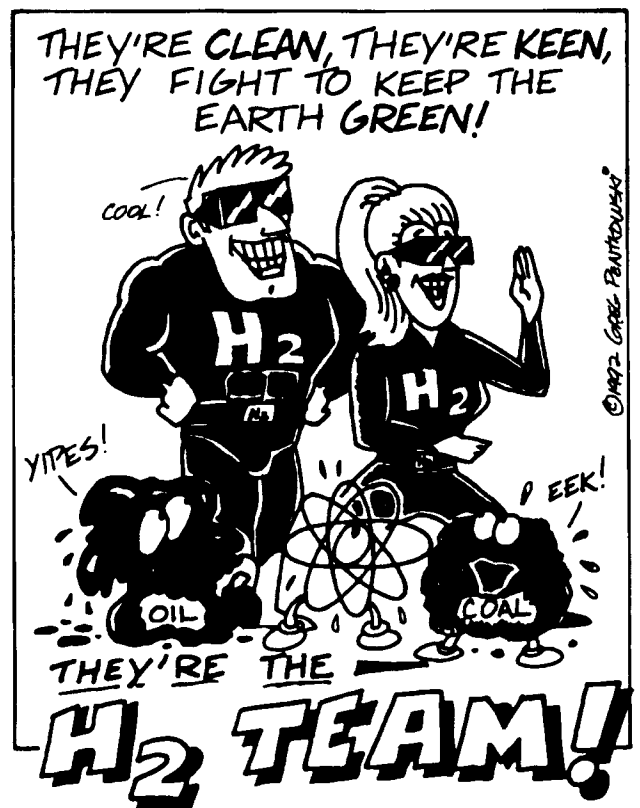
The corporation concept should be announced, on the one hand, as a major government commitment, but it should also be non-partisan and relatively free of governmental control. Otherwise it will simply be perceived as another of a long line of energy programs that have fallen on their face as a result of suffocating bureaucracy, conflicting political special interests, and lack of funding. Besides needing a small amount of governmental seed money, the corporation [I would envision] could be financed through long-term government-guaranteed bonds, possibly with an initial commitment of \$50 billion. Repayment of the bonds would be made, in ten or twenty years, from the profits from royalties and patents of technology development.

The corporation would function not too dissimilarly from NASA, except that it would be a for-profit corporation and run by businessmen, not by Congress. It would enlist the aid of thousands of private corporations and coordinate their efforts towards the main goal of developing energy technology. Millions of dollars of feasibility studies carried out by private companies would soon be converted to billions of dollars in research and development contracts, which, in turn, would be converted to the manufacture of various energy technologies and products to be sold throughout the world, with the profits shared by private industry and the coordinating corporation.

Individual benefits would include the encouragement of the preservation of our pool of scientific and engineering talent now being threatened by the loss of defense contracts; the encouragement of our youth towards careers in science and industry; and the re-assertion of the U.S. as an economic and technological superpower. Long-range benefits would include a new industry for the employment of tens of thousands, a potential dramatic shift in the relative balance of payments between the U.S. and other parts of the world — especially oil-producing countries and high-tech countries like Japan; and a better life for all of us with the potential of an almost limitless source of energy in a clean environment.

I. Jerome Hirsch
JAREN CORPORATION
Phoenix, Arizona

Ed Note: Look for the D.O.E. response in our next issue.



He's Keepin' It Simple

By Darin Selby

After about a half hour of driving down wrong dirt roads I look off in the distance across the flat farmlands of Iowa to see a rare and wondrous sight. Two-three bladed windmill towers spinning merrily 'round and 'round! Here I was finally being able to go out and meet this mysterious man who has bucked the system longer than my parents have been alive!

As I step out of my car, I notice how peaceful and still it is to live out here. The slight charging sound of the two 30 foot windmills spinning in the country wind gave me the feeling that someone had to be around.

As I looked around the first thing that caught my eye was a solar-powered four foot tall cat house, and several kitty cats peering out at me through a plexiglass window. As I chuckled to myself in amazement a tapping sound on a window from a man in his mid-80's got my attention. It was John Lorenzen out in his warehouse-sized garage motioning for me to come in.

I scrambled over there and shook his hand. I was impressed how eager and patient he was to explain in detail all my questions about his inventions. There are many things I could share about my vist, however, I would like to explain how simple and inexpensive it is to build an electrolyzer.

The device consists of 1" x 6" stainless steel plates (though he believes that nickel plate substitute would be much more efficient) that are no more than 1/32" thick. Spaced apart about 1/8", one plate would be negative and then the next one positive. This made a horizontal stack of about 20 plates. He had a DC power source of 50 volts at about 50 amps from the Jacobs wind generator. The electrolyte consists of regular tap water and a dash of potash, which is sprinkled carefully into water while it's being stirred. (Edison almost blew himself up adding water to potash.)

Thomas Edison's dream of a localized DC power source has now materialized in this tranquil mid-Western setting. With a storage system of 85 year-old Edison nickel/iron batteries (which John says still work like new) he cranks on the DC juice up to around 150 amps while immersing this electrolyzer in the potash solution. After a minute or so of its fizzing like an alka-seltzer tablet gone haywire John comments that he just produced enough hydrogen and oxygen to send me to Des Moines.

John's life work is an example of using cheap low-tech material combinations to do the same thing (if not better) as the expensive high-tech companies are doing. What an inspiration this man is for all of us.



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Upcoming Events. . .

- March 6-8** - Eco Expo, Los Angeles, CA, AHA to support a booth, Contact L. Essel (213) 949-9482
- March 10** - Southern CA AHA Chapter Meeting, contact Dick Williams at (213) 949-9482
- March 11** - A.S.U. Table on Mall, Open Forum 11:30 AM - 2 PM, Audio-video presentation Pima Room at 2PM, Contact Harry Braun at (602) 421-0433
- March 14** - Silicon Valley Chapter Meeting, Contact John Gotthold at (408) 730-5114
- March 18** - AHA-ASU Regular Meeting, 7 PM, Student Services Bldg. Amphitheater, ASU, (602) 421-0433
- March 18-20** - National Hydrogen Association, 3rd Annual U.S. Hydrogen Meeting at Holiday Inn - Crowne Plaza, Arlington, VA, Contact Jeffrey A. Serfass at (202) 223-5547
- March 24-25** - Globalcon '92 Conference and Exposition, San Jose Convention Center, Alternative Energy Congress, Contact Gayle Bayne at (602) 280-1440
- March 28** - Southern Arizona AHA Chapter in Tucson, First Public Forum, Contact Jim Wolford at (602) 742-3126 or Steve Dirks at (602) 886-3400
- April 4** - Earth Day, 10 AM - 4 PM at Glendale Community College, Contact Roland Darr at (602) 921-0433
- April 17-19** - Route 66 Canyonball Run, A Race for the Environment, celebrating the 66th Anniversary of Route 66, Contact Dan Parnley (602) 243-1642
- April 20** - Earth Day, Contact James Bailey at (602) 381-0284 or (602) 257-0101
- April 22** - Sun Day, 1992, AHA joins Public Citizen in launching Sun Day, 1992, (602) 921-0433 for info
- April 24-25** - Sun Day, Prescott Environmental Energy Fair, with hands-on learning, (602) 445-8531
- April 25-26** - 2nd Annual Solar Electric 500, Phoenix Int'l Raceway, West of Phoenix, AZ, (602) 953-6672
- April 25-26** - Earthfest '92, Scottsdale Municipal Stadium, Scottsdale, AZ, (602) 952-1300
- June 22-25** - Ninth World Hydrogen Energy Conference, Paris, France, Tel: 33(1) 42 94 27 67, FAX: 33(1) 42 93 29 67

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*Have an event for our calendar?
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Hydrogen Today Is Changing

Notice anything different? We've given our Hydrogen Today publication a brighter look, and we're working to attract new writers. These changes are being made so that we can bring more news about hydrogen and renewable energy to our members ... and to more of the general public.

The new and improved Hydrogen Today is being expanded as well to take the place as well of the once-published journal, Hydrogen. By combining these two publications, we can focus our efforts and make the most efficient use of our limited AHA resources.

AHA publishes Hydrogen Today to help educate the public about new developments in renewable energy and the science and people behind them. It also lets our Association members know about AHA news.

Would you like to help? We are always looking for interesting and informative articles and announcements to bring to our readers.

New Features to look for in future issues. . .

- *Editorial Cartoons*
- *Hydrogen Crossword Puzzle*
(Answers to be found in articles)
- *Photos of our Regularly Contributing Writers*
- *More Graphics and Photos*

Hydrogen Today Writer's Guidelines:

Articles published in Hydrogen Today should be informative and written in a style that members of the general public can enjoy. Acceptable topics include all forms of renewable energy developments and technology, such as solar, wind, biomass, and ocean thermal energy systems, energy efficiency, and new and innovative applications of renewable energy.

Related social and business issues are also of great interest, since the advancement of renewable energy is keyed to the marketplace and to public acceptance. Pure editorials and opinion, however, are less often used.

Photos and other graphics are highly desirable. Try whenever possible to include some form of illustration or photo, preferably black & white, to help readers visualize and understand the article. Photos of the author are also welcome.

Hydrogen Today also features a Calendar of Events and selected Letters to AHA. Please let us know about upcoming events of interest to our members, and write us about news that you may discover yourself.

The tentative deadline for the next edition of Hydrogen Today is March 28, 1992. We reserve the right to be selective of material received and to edit for length or readability if necessary. Each column of text in the publication is about 300 words, and articles are commonly about 300 to 1,000 words in length. Longer articles may be, at least in some cases, excerpted or published in parts over more than one issue.

Please join us in helping educate the world about clean, renewable energy resources!

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