

Hydrogen Today

"Clean Energy For A Better World"

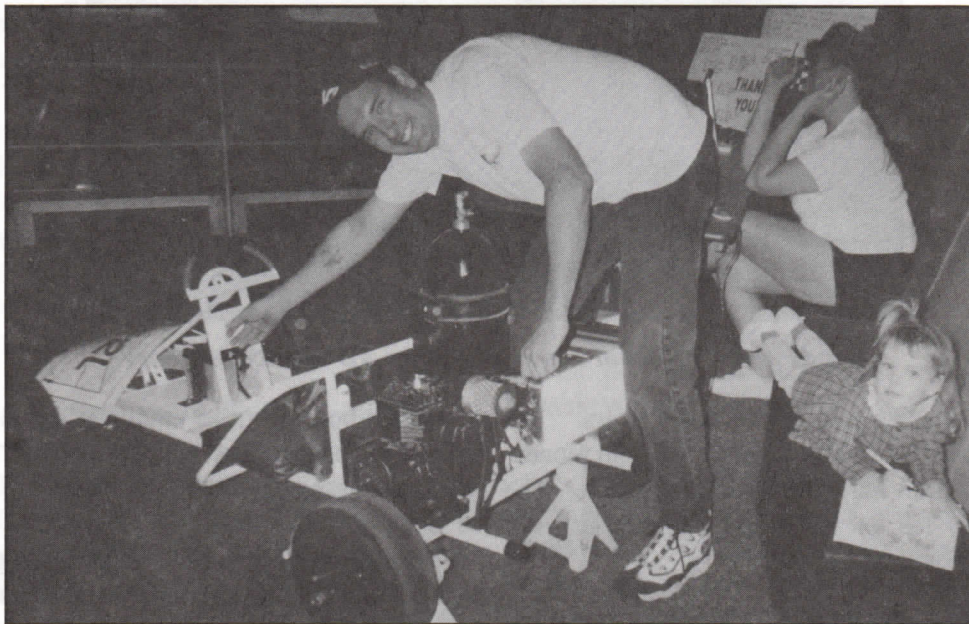
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ALTERNATIVE FUELS RACING LEAGUE WORLD'S FIRST CLEAN FUEL GO-CART RACE

APRIL 18, 1999

10:00 a.m. to 5:00 p.m.



Randy, Misty and Brooke Olive at the Arizona Science Museum

One way for everyone to learn how to convert engines is to start with a single-cylinder engine. Randy and Misty Olive are starting the Alternative Fuels Racing League AFRL. It is open to all participants willing to take pride and attain the highest safety standards. Please write to Randy and Misty for the rules of the racing league... 1001 East Pasadena Avenue, Phoenix, AZ 85014 or phone: (602) 264-3296.

The world's first clean-air go-cart race will be held at 10919 S. Central Ave (by South Mountain Park) in Phoenix, AZ. The track is an oval asphalt track and is 1/20 of a mile. The racing categories will be arranged according to the entries. Any competent driver that brings a clean-fuel racer that is built according to the safety rules can race. Entrants must demonstrate capabilities and competency for safely refueling, starting, stopping, and operating the go-cart on the track. A Point System will include high marks for safety, cleaning the air, and competitive courtesy. At the end of the season, the person with the most points wins. Prizes will be awarded at each race. Trophies and prize money will be awarded at the end of the season for the top point winners.

The league will have an annual point system to win the grand prize. Everyone wins the prize of cleaner air and benefits from the capabilities that the community builds by supporting clean air racing. Examples set by these racing pioneers will surely spread throughout the racing community.

Randy Olive is building a hydrogen stock car racer and plans to develop a class of the Alter-

with racing enthusiasts. But you need to get started as soon as possible.

You can build your own Go-Cart or convert an existing Go-Cart. You can see by the picture on page 1, that Randy welded up a tubular frame according to the strength and dimension rules. Examples of engine types are Briggs & Stratton, Honda, John Deere, Tecumseh, etc., and must be stock, with



Randy with Cub Scout Troop 448 at the AZ Science Museum

native Fuels Racing League for Stock Cars. The Go-Cart and the Stock Car Classes will help pioneer development of an Indy 500 hydrogen vehicle. The Go-Cart entry fee for the World's First Clean Air Go-Cart Race will be \$25.00.

Corporate sponsors are needed. Corporate sponsors may have Go-Carts displaying their logo and, if needed, AFRL will provide drivers. This will help drivers who want to participate, but do not have the funds to build or buy a Go-Cart. Some drivers may want to pay a small fee per turn around the track on a hydrogen Go-Cart.

Randy and Misty have two children; Brandon and Brooke. Brandon is 6 years old and has his own Go-Cart. Randy raced stock cars in New Mexico before moving to Arizona. Randy's mission with the Clean Alternative Fuels Racing League is to teach performance-minded builders how to convert an engine to minus-emissions operation. AHA mentors will be sharing their technical know-how

no internal bore or stroke modifications allowed. No turbo or superchargers will be allowed. Only one engine per go-cart.

Races will be provided for hydrogen, CNG, landfill and Hy-boost fuels. The type of fuel must be indicated on the cart. The highest fuel points will be awarded on "minus-emissions" systems for cleaning the air at the point of fuel production and at the race.

Misty Olive is starting a Speakers Bureau for the Alternative Fuels Racing League and will have speakers provided for schools, corporations and service organizations. Misty is very goal oriented and has great organizational skills. As Misty often says, "Our motto is "racing for a cleaner future." We can solve the emission problems now, and we owe it to our children to have clean air to breathe. Together we can solve the 'brown cloud' problem. Bring your "Brown-Cloud Busters" and race.

AHA Spring Classes

CLIMATE CHANGE AND KYOTO PROTOCOL CONFERENCE

On *March 13th and 14th 1999* the American Hydrogen Association will provide the **Alternative Fuel Conversion** two-day short course on how to convert engines to operate on hydrogen, landfill gas, natural gas, or propane. The class will cover engine theory and practice; conversion kits and suppliers; fuel storage technology and delivery options; performance and safety tips; taxes and other incentives for vehicle conversion; and fuel station development. Class will be taught by Roy McAlister, Mel Larsen, Monte Ogdahl, and Randy Olive. Monte Ogdahl will demonstrate his prototype electrolyzer and provide sessions on his achievements with on-site generation of hydrogen.

On *March 20th and 21st, 1999*, the **Hydrogen Fuel Cell** two-day short course will be offered. You might have noticed that our last two issues *Hydrogen Today* provided information on the theory of fuel cells. Roy McAlister, the class instructor, wrote his Master of Science thesis on Hydrogen Fuel Cells.

Two luncheons will be provided plus snacks. On the second day, lunch will include a hydrogen BBQ. Class starts at 8:30 a.m. and continues to 4:00 p.m. each day. A \$50.00 deposit is required to hold your reservation. The total cost of the class is \$325.00 per student for AHA members (\$500 for non-members). Books will be provided.

A Mini-Conference on **Climate Change and Kyoto Protocol; Agenda 21 Reference Groups** will be provided *April 24th & 25th, 1999*. Tom Dickerman, Laurina Bergqvist and Roy McAlister will be the session leaders for the Conference. The cost of this conference will be \$75.00 including lunches, snacks, books and materials. Greenhouse gases are the leading cause of climate change. According to the NASA's Goddard Institute for Space Studies, global surface temperatures in 1998 set a new record - since measurements have been recorded starting in 1860. The 1998 global temperature average exceeds that of the previous record calendar years of 1995 and 1997. The globe is experi-

encing earlier Spring and later Fall seasons. This allows some farmers to double crop while others are flooded or suffer from droughts. The rapid global warming since the mid-1970's exceeds that of any previous period of equal length during the history of instrumented temperature.

An typical example of vested interests is the Illinois Senate accepting Governor Jim Edgar's recommended changes to legislation that prohibit the Illinois Environmental Protection Agency (IEPA) and Pollution Control board from adopting new incentives for combating global warming. The Illinois Senate's 56-0 vote prevents environmental officials from unilaterally instituting programs that further the goals of the Kyoto Protocol...Agenda 21. However, they will follow the US Clean-Air Act. The law written by the Illinois coal industry intends to protect business as usual. The State will not limit private participation in ongoing, voluntary initiatives to reduce emissions of greenhouse gases. We need more vested interests in renewable resources and the pollution free planet. It will produce sustainable wealth expansion.

The American Hydrogen Association offers to provide information to Clean Air Reference Groups. The Conference will be designed for leaders that want to step forward on this important task. It staggers the imagination to think of the monumental task of producing energy cleanly. But every leader knows that as step-by-step methods surface, and goals are set, the details fall into place.

Most of the work by the reference groups can be in our own backyards, cities, counties or states. Civilization must find adequate resources for sustainable living. As we learn together, society will adopt new practices, traditions, living patterns, and soon we will wonder how we ever allowed smog and pollution to result from our waste of resources.

You can make a difference. Plan to attend this Spring conference and classes. Please register early, so we can accommodate you. 602-827-7915.

WRITE A LETTER:

One of the most important things a citizen can do is to keep in touch with elected representatives. Charles Terrey, AHA Vice President, is an outstanding letter writer. Here is an answer from John Shadegg, one of Arizona's U.S. Representatives, to the question that Charles Terrey asked about the U.S. plans for reducing greenhouse gases.

Dear Charles,

Thank you for contacting me regarding legislative provisions in Appropriations legislation for fiscal year (FY) 1999. This is an important issue to me and I appreciate the opportunity to address your concerns. I further apologize for the delay in responding.

I supported H.R. 4194, the Veterans Administration/Housing and Urban Development (VA/ HUD) Appropriations Act for FY 1999 which passed the House with my support on October 6, 1998 and became law on October 21. As the appropriations vehicle for the Environmental Protection Agency (EPA), this bill provided \$1.8 billion for the *Environmental Programs and Management* account from which funds may be drawn to study global warming, however, there is no set amount for this purpose.

H.R. 4194 also contains a provision which forbids the Administration from proposing or issuing regulations which implement the Kyoto Protocol on global warming. This provision does not, however, forbid the EPA from studying global warming. This legislative provision was mischaracterized as "anti-environmental" and harmful by a number of national organizations. The provision is intended to ensure that the EPA does not attempt to implement the requirements of the Kyoto Protocol through administrative regulation. Such regulatory implementation would subvert the Constitutional requirements that all treaties be approved by the Senate and that all changes to the law be voted on by Congress. It is inappropriate to characterize as harmful a provision which upholds the Constitutional framework of a separation of powers between the Executive and Legislative Branches of government.

Again, thank you for sharing your thoughts with me. I hope that you will not hesitate to contact me in the future.

Sincerely,
John Shadegg, Representative, U.S. Congress

AGENDA 21-SUCCESS DEPENDS ON U.S.

By: Laurina Bergqvist

Let's learn now about our chance for a better future. Naturally, we cannot work toward goals if we don't know them. The U.S. has the potential to bring us all closer to the goals of Agenda 21, as outlined by the Rio Summit and the Kyoto Conference, yet strong forces have chosen not to. Because of the U.S. reticence and its lack of dedication or direction, the world is now further from the Agenda 21 goals than when we began in 1992. We can still change.

In 1992 the U.S. promised to follow the Agenda 21 action plan for sustainable development

for the 21st century. My country of residence for the past 14 years, Sweden, signed as well making Agenda 21 a very high priority on their political agenda. Agenda 21 has become a phrase that almost every Swedish person is familiar with. You'll find an Agenda 21 budget in almost every city government in Sweden, some even employing an Agenda 21 coordinator.

All the countries agreed to establish local Agenda 21 policies and reference groups by 1996. The Kristianstad (Sweden) local government helped four reference groups start by 1995. The first three reference groups focused respectively on Energy, Transportation, and Agriculture and attracted almost exclusively men. They discussed new technology – what was best for the environment and how to apply that knowledge. The fourth reference group was about Women.

With more than 30 chapters in Agenda 21, there is more to it than Energy, Transportation and Agriculture. It's also about PEOPLE! While one chapter is devoted to WOMEN, another concerns CHILDREN. For example, Agenda 21 promotes, "advancing the role of youth and actively involving them in the protection of the environment and the promotion of economic and social development."

The grassroots movement in the U.S. is full of exciting ideas, technology and leaders. If all those organizations working for a better environment in the U.S. cooperated and coordinated their activities, the effect would be noticeable. Even cooperation is a part of Agenda 21.

Agenda 21 presents us with the chance to expect something good from our government. They really are here to serve us, if we just demand our rights. And we have the right to a sustainable society, and we have the responsibility to help make it.

During my stay in the U.S. I've seen a number of people involved in exciting "Agenda 21 projects." BUT most of them don't have that established as their goal. The thriving grassroots projects I've seen here in the U.S. haven't mentioned Agenda 21 in anyway. WHY?? Does this mean the United State

of America can't unite behind a common goal, a promise for a better future?

A promise is binding at least to the other countries of the world. The U.S. also signed and promised to work toward the goals of Agenda 21. This is a promise we can make them keep! We can make our government use Agenda 21 as the measuring stick with which they check if every decision they make "measures up." Every decision made by our government now has to lead us in the right direction, toward the goals of Agenda 21.

From what I've seen of the countries of Europe, they are making changes and working toward the Agenda 21 goals. In Sweden, the changes are happening slowly from the top down. But the changes are happening!

The American Hydrogen Association furthers the goals of Agenda 21 by promoting hydrogen as a renewable energy source. Under the Agenda 21 chapter 9, one goal is to "promote the research, development, transfer and use of technologies and practices for environmentally sound energy systems, including new and renewable energy systems..."

We all need to keep the goals of Agenda 21 in our minds, our organizations, and in every decision made by our government. In 1992 the world chose the right direction to go, now the U.S. has to start moving as well. Learn, Teach and Keep the Goals in Mind! See our website: www.clean-air.org for additional information and web locators for Agenda 21. Or gopher://gopher.un.org/11/conf/unced/English

"Earth Odyssey: Around the World in Search of Our Environmental Future," by Mark Hertsgaard offers insights into humanity's growing addiction to the automobile, the spread of nuclear technology, the risk posed by population growth and climate change, the tension between capitalism, socialism, and communism and the health of our society in a toxic world. The hard-cover is available through Broadway Books, 1540 Broadway, New York, N.Y. 10036.

WILL GREENHOUSE GASES TRIGGER A GLOBAL CATASTROPHE?

By: Roy E. McAlister

Geological evidence indicates that Earth has had relatively stable weather conditions during the last few thousand years. However, about 55 million years ago it appears that after a period of slow global warming a threshold temperature was reached that caused rapid releases of methane and carbon dioxide from the oceans. Rapid global warming that followed was too abrupt for adaptation by countless forms of life and appears to have caused extinction of millions of species.

Was this what happened to the dinosaurs in the period 10 million years before that? And what were the conditions in the previous 400 million years that occasionally caused rapid erosion of the mountains and deposition of hundreds of feet of silt, sand, and gravel over vegetation and biomass accumulations to produce the anaerobic consolidation into vast coal fields?

To gain insight to these questions, Stephen Schneider a climatologist at the University of California at San Diego is researching why Siberia is experiencing more concentrated greenhouse warming than other areas of the globe. He warns that the Siberian warming could be due to increased concentrations of methane that escapes from permafrost deposits of rotting biomass. Warming of the permafrost could trigger much faster releases of methane that blocks infrared radiation much more than carbon dioxide. He estimates that billions of tons of methane is trapped in the permafrost and could be released at much faster rates due to continued global warming.

Some 10 trillion tons of methane is trapped in cool pressurized crystal structures around the edges of the continental shelves. Gerald Dickens a geologist at James Cook University in Townsville, Australia, believes that these methane ice crystals are "the Earth's largest fossil-fuel reservoir." But these methane ice deposits have never been successfully tapped or mined because of the difficulty of extracting them without causing their release to the atmosphere. Mr. Dickens warns that the methane ice deposits are fragile and could be released by further greenhouse gas accumulations to cause runaway warming of the planet.

Two years ago some of the Northern Section of the 620 mile-long Larsen Ice Shelf collapsed into the sea.

Under current conditions according to Rudi del Walle, Director of Geology at the Argentinian Antarctic Institute, the rest of the ice shelf could collapse in the near future. Over the past 50 years, the Antarctic Peninsula has apparently experienced sustained atmospheric warming of 4.5 degrees. The West Antarctic ice sheet contains 3 million cubic kilometers of ice, if melted, enough to raise sea levels worldwide.

A related weather driven catastrophe may involve the Gulf Stream of tropical water that flows through the Atlantic warming Ireland, England and the rest of Northern Europe. Geological evidence indicates that the Gulf Stream could stop flowing because of greenhouse heating of ocean areas that have been cooler for 10,000 years. During this time, cooler, saltier, and denser waters continuously sank to the ocean floor and headed along the ocean floor towards the tropics while the Gulf Stream flowed in the opposite direction near the surface to warm Northern Europe. Melted ice from the Arctic reduces the salinity and density of the North Atlantic waters. Unless these waters stay cold, salty, dense, and sink, the Gulf Stream will not flow. If this circuit is interrupted by global warming, it will cause a big chill in Europe. England could be 20°F cooler and experience winters more like those of equal latitudes in Canada.

Solar hydrogen provides Civilization with options for halting and reversing greenhouse gas warming. Fossil reserves equivalent to some 180 million barrels of oil are burned each day to supply global energy needs. This releases enormous amounts of fossil carbon as carbon dioxide. In North America the annual amount of carbon that decays into the atmosphere from city and agricultural wastes exceeds the amount of carbon mined as coal. We can replace fossil fuels with solar hydrogen.

We can capture carbon from the environment by converting sewage, garbage, agricultural wastes, and methane into carbon for making durable goods. Hydrogen that is co-produced with carbon is then used as a minus-emissions fuel that cleans the air. Using solar hydrogen in motor vehicles and co-generation engines to produce electricity, refrigeration, and heat will provide better conditions for all life forms and a healthier economy.

THE INTERNATIONAL RENEWABLE RESOURCES INSTITUTE

By: Alison Valencia and Kathy McAlister

In 1989, the American Hydrogen Association was formed as a "501(c)3" nonprofit organization to do research and provide education on renewable resources, particularly solar hydrogen. Regardless of the diverse political leanings of its members, AHA is nonpolitical. Our purpose is to provide Civilization with scientifically proven options for using energy from the sun to add wealth by producing energy-intensive goods and services. Renewable energy in the form of solar hydrogen adds sustainable wealth to the planet.

Our mission is to support and advocate ideas and research that provides safe, economical, and sensible options for using renewable resources in place of fossil resources such as coal, oil, and natural gas. AHA advocates "*prosperity without pollution*" to preserve the gains of the Industrial Revolution, foster transition to the Renewable Resources Revolution, and to facilitate recovery of the Earth's ecosystem. We believe these pursuits will bring a new and much better economy, which has been termed "*Ecolonomics*" by Dennis Weaver.

The first decade of AHA was dedicated to establishing worldwide awareness through education about renewable resources. In Europe, Asia, South & North America we demonstrated the chemistry, physics, and engineering needed to advance hydrogen as a replacement for polluting energy systems.

FORMING THE IRRI:

A new institute is planned to address implementation of renewable resources. The founding structure of the International Renewable Resources Institute (IRRI) believes wholeheartedly that education is the key to the door of change.

The first campus of the IRRI will be near a *landfill solar energy park* from which landfill gas will be collected. Since the beginning of Civilization, landfills, of some description, have been used to collect what society discarded. Every city, town,

and settlement struggles with landfill problems. Landfill gas typically contains about equal percentages of carbon dioxide, methane and lesser amounts of nitrogen, hydrogen sulfide, and water vapor. The methane is about seventy times more harmful as a greenhouse gas than the carbon dioxide. IRRI researchers will show how to provide the energy and material resources needed for a sustainable community by extracting hydrogen from the methane and other resources of the landfill. By using solar, wind, or hydro, energy for this extraction, the extent of wealth addition is increased.

Future historians may say the business of the 20th century was making wastes from Earth's resources. In the 21st century we must take waste and make resources.

The IRRI develop additional educational centers at proposed renewable energy parks throughout the world. These energy parks will be places to visit and learn about practical opportunities to utilize renewable resources. Rotary International, American Lung Association and other service organizations have similar visions for supporting "the Pollution Free Planet" and "Ecolonomics" concepts of IRRI. Many of these organizations have international academic exchange programs for students looking for well thought-out programs.

IRRI's Task Force has met once a week for nearly a year to work on details of the energy park. The first IRRI conference, "*Climate Change and Kyoto Reference Groups*" will be April 24 and 25.

This conference will be devoted to development of a strategy for achieving a sustainable world economy. The question we ask ourselves, and we ask you is: **How does the world move from a polluting economy to one that is more prosperous, particularly at the individual level, while eliminating pollution?** Particular emphasis will be placed on utilization of carbon, that now enters the atmosphere from rotting organic matter and burning of fossil fuels, to produce durable goods.

Sequestration of carbon from the atmosphere has been a major achievement of nature for

millions of years as evidenced by the extensive deposition of coal, oil, natural gas, limestone and other carbon-rich minerals in the Earth's crust. Previous to the deposition of stabilized storage of carbon-rich minerals by nature, Earth's atmosphere apparently carried higher concentrations of water vapor, carbon dioxide, methane, and other greenhouse gases.

Over a period of some 500 million years greenhouse gas concentrations were reduced. Atmospheric carbon became incorporated in the tissues of green plants and the rest of the food-chain. As a small fraction of the participants of the food chain entered storage as fossilized deposits, the carbon content of the atmosphere was gradually reduced. Eventually atmospheric carbon reached a level that remained relatively constant for millions of years.

Nearly all of the present atmospheric carbon build-up occurred in the last century. The annual rate that we burn carbon is equal to about 10 million years of fossil carbon accumulations.

Burning carbon based fuels and heating limestone to release carbon dioxide (calcining) has quickly reversed nature's system for storing carbon as a constituent of solid minerals. The two major contributors of carbon in the atmosphere are carbon dioxide and methane. Heavier hydrocarbons and particulates provide much smaller additions of carbon to the atmosphere. Human efforts to find the good life, have caused the global atmosphere to be 25 to 30 percent higher in carbon dioxide and nearly 100 percent higher in methane than at any time in at least the last 160 thousand years as evidenced by arctic snow cores.

Records show exponential atmospheric carbon increases in the last century as the Industrial Revolution expanded. This expansion was closely tied to a market, that grew from one billion persons with no concept of mechanized farming, artificial lighting, refrigeration, or motor vehicle travel to six billion persons, that believe it is a "human right" to have all of these energy-intensive benefits.

IRRI will demonstrate how to produce energy-intensive goods and services, while sequestering carbon from the atmosphere. Such applications of renewable resources will result in a wealth expansion economy that provides sustainable gains of recyclable goods.

This evolution to "economics" will provide carbon from sewage, garbage, and agricultural wastes. "Solar Carbon" like "Solar Hydrogen" will

be produced by harnessing solar or derivatives of solar energy to extract carbon from organic wastes that contain carbon that has been sequestered from the atmosphere.

IRRI will recruit city managers and delegates from the world's most polluted cities and challenged economies. Study programs in sustainable economic development will emphasize the role of the environment as the most basic and valuable asset in business planning. Earth's environment supports all life and economic development. No other planet has been discovered within our solar system or beyond that hosts the interdependent diversity of life including millions of species and types of life forms. We have a moral obligation to protect planet Earth.

We invite you to help launch the Sustainable Resources Economy - "*prosperity without pollution.*" It is time to stop using our resources for waste and pollution.

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ON-BOARD HYDROGEN GENERATORS

Outline of Options By: Roy E. McAlister

A. HY-BOOSTING: It is a valuable to add hydrogen to hydrocarbon fuel because:

1. Hydrogen burns faster than any hydrocarbon and helps kindle hydrocarbon combustion to provide more complete combustion. Increasing the rate of combustion allows spark timing to be closer to top dead center. This reduces backwork and improves thermal efficiency.
2. Hydrogen sources no pollutants such as CO, N_x, No_x, HxCy, CO₂
3. Hydrogen allows the leanest fuel/air mixture for improved thermal efficiency.
4. Hydrogen can allow unthrottled engine operation at all engine speeds and power levels to greatly improve "part throttle" efficiency.
5. Hydrogen reduces CO, HC, NO_x by facilitating excess-air combustion.

B. There are several technologies for producing hydrogen on-board a vehicle including:

1. Electrolysis using alternator-sourced electricity. A fuel such as gasoline powers an engine to turn an alternator to supply electricity. Gasoline used in the engine to produce an amount of hydrogen required to release as much heat as a gallon of gasoline is found from the overall energy-conversion efficiency of the process:

Assumptions:

engine efficiency	= 30 percent
alternator efficiency	= 80 percent
battery efficiency	= 90 percent
electrolyzer efficiency	= 90 percent

Therefore, the overall energy-conversion efficiency for driving an alternator with an engine and using the vehicle's electrical system to power an electrolyzer is:

$$(.30)(.80)(.90)(.90) = 19.44\%$$

Suppose adding 3% hydrogen energy along with oxygen gives 10% improvement in engine efficiency. Does it pay to make 3% hydrogen? The overall energy-conversion efficiency (based on a 40% efficient engine) becomes:

$$(.40)(.80)(.90)(.90) = 25.92\%$$

Thus, it takes 3.88 gallons of gasoline to make enough hydrogen to equal one gallon of gasoline in heat release. Each gallon of gasoline would be improved by 10% or 0.1 gallon, compared to operation without addition of the 3% hydrogen, but it would require burning .116 gallons of gasoline to make the 3% addition of hydrogen.

$$(3.88 \text{ gallons gasoline})(0.03) = 0.116 \text{ gallons}$$

thermal efficiency in order to achieve any net fuel savings.

2. **Electrolysis** using "stopping energy" of the vehicle. This would only require the extra gasoline for overcoming additional rolling resistance for "carrying" the apparatus needed. It would be an excellent use of stopping energy if it used inexpensive and reliable equipment to convert stopping energy into hydrogen.

3. **Thermochemical regeneration** in which waste heat (over 50% of the energy not used for shaft power) can be used in endothermic reactions to produce hydrogen from gasoline. In this process, waste heat plus gasoline plus water produces a fuel mixture of hydrogen and carbon monoxide that releases about 20% more heat than the original gasoline.

HY-BOOSTING THE FRANCIS TYSON GEO:

Thanks to Francis Tyson, Charles Bensinger, Randy Olive, and Roy McAlister, who were active participants in converting Francis Tyson's donated GEO. A 20,000 mile road test has been started and the results are very encouraging. I noticed that the performances of the GEO is much better on Hy-Boost than on straight methane. Future articles will follow the 20,000 mile test and additional conversion details that are planned.

POLLUTER TAX BREAKS

Ref: Friends of the Earth

Congressional Joint Committee on Taxation shows that benefits for fossil oil and gas industries will include tax breaks totaling \$11 billion with \$2.4 billion for Depletion Allowance, \$0.3 billion for Enhanced Oil Recovery, \$2.2 billion for Intangible Drilling Costs, and \$6.2 billion for Nonconventional Fuel Production Credit.

Double Talk:

What does it mean:

To increase research and tax incentives for a new generation of ultra-clean fossil fuel technologies? It means more money for the oil and coal industries.

To have mandated clean California gasoline? It means more greenhouse gases...as the clean California gasoline requires more refinery releases of carbon dioxide and other pollutants.

SO, WHO PAYS FOR STRANDED COSTS ?

From the St. Louis Post-Dispatch report:

The 950 MW Clinton nuclear power plant located near Clinton, Illinois is being sold for about \$80 million...resulting in a loss that may be as high as \$1.6 billion. Clinton nuclear power plant shut down in September, 1996, due to mechanical problems that would have cost the company \$210 million to repair.

Soon we must decide who should pay for stranded costs throughout the USA. Should it be rate payers or the stockholders? Shareholders have taken the profits all the decades that the utilities operated as protected monopolies. Taxpayers have paid for the US nuclear program that further subsidizes the utilities.

Tax and rate payers are being taken but not to the cleaners. It is time for deregulation without penalizing rate payers with stranded costs.

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MARCHING ON WASHINGTON D.C.

Kathy McAlister

It was my first march, January 1999. Always before I had been unwilling to spend time on such matters. But this time I wanted to see what it was going to be like to march for renewables *in Washington D.C.*

It was a piece of cake! Nothing happened. We came home, I walked in the house, the phone rang. It was my father in Kansas...I am in Arizona. His voice was serious. I said to myself, "How did my father 1,000 miles away in Kansas find out so fast that I had been marching about something he would discourage!"

I was sure that my father had figured out by the time I got home what I had been doing. But, as he continued I suddenly realized it was another issue that spurred his call.

In that instant I realized that you shouldn't march if you are concerned about self reproach for wasting your time or afraid of what others will think about your convictions. In that same instant, I realized that what I thought and believed was important. It was worth marching, letter writing, and voting.

Peaceful marching is a public statement, a way to express your opinion. That is what marching is all about. **Going to Washington D.C. on October 24th, 1999, is to let others know that you support renewable resources.** It is a way of saying that you support the replacement of the existing polluting energy systems with those that are non-polluting and renewable.

So who will be there? Most people support the concept of renewable resources so long as it does not interfere with their pocketbook. But, who will show up at a march in Washington, D.C.? There will be live music. Oh, by the way, plan to see politicians running for office – it will be closer to presidential election time. Great speakers, radio and TV interviewers, photographers, and celebrities. You won't want to miss this event.

Oh yes, it helps to make a well thought out sign that does your talking for you. For more information and literature please write to: Richard Lasken, c/o University of Maryland College Park, Stamp Student Union /Box 73, College Park, MD 20742.

HYDROGEN COMPANIES

<u>Companies</u>	<u>Symbols</u>
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Hydrogen Fuel Cell Companies

Ballard Power	BLDFF
General Electric	GE
United Technologies	UTX
Energy Partners	N.P.T.

Hydrogen Producers:

Air Products	APD
Praxair	PX

Fuel Cell Membrane Companies:

Dow	DOW
DuPont	DD
3M	MMM
Dais	N.P.T.

(N.P.T. = Not Publicly Traded)

There are many other hydrogen related companies that are doing great work, many of which are not on the stock exchange.

All hydrogen companies need your encouragement. Please send in formation about your favorite hydrogen related company. AHA will continue to add companies the investment opportunity list.

Fellowships Available

U.S. DOE news release:

A new Graduate Automotive Technology Education (GATE) program to provide graduate fellowships for students in automotive engineering programs will be available for 9 Universities. The University of California Davis and Virginia Tech will host the GATE centers for fuel cell research. Each center will receive \$200,000 from DOE to develop an interdisciplinary graduate curriculum and \$100,000 annually for fellowships. This will fund about five students.