

Phoenix Project Foundation



Rising from the ashes of fossil and nuclear fuels
to a Solar Hydrogen Economy by 2015

Paul R. Krugman
Professor of Economics and International Affairs
Princeton University

Subject: Using \$8 trillion to implement a Solar Hydrogen Economy, which will provide a fundamental and unified solution to the many of the most serious economic, energy, environmental and related healthcare problems, with technologies that could have been mass-produced in the 1920s.

Dear Professor Krugman,

Congratulations on your well deserved Nobel Prize in economics. Given your highly distinguished career and your skill in analyzing and communicating the fundamentals of complex issues, you are particularly well-qualified to review of our attached Phoenix Project proposal, which was recently peer-reviewed and published in the international *Chemical Engineering and Industry Quarterly*, and is now posted on our PhoenixProjectFoundation.us website. Ironically, the over \$8 trillion that has been allocated by the Bush administration for the financial bailout, is also about the same amount of money that would be needed to build and install the 5 million 2 MW wind-powered hydrogen production systems that would be needed to displace not just imported oil, but all of the fossil and nuclear fuels now used in the U.S. -- as well as the engine conversion systems for the existing fleet of 250 million automotive vehicles so they will be able to use hydrogen or gasoline fuel interchangeably.

This reindustrialization effort would not be creating make work jobs, but over a trillion dollars of wealth annually with a fuel that is inexhaustible and pollution-free. The cost would also include modifying all of the existing service stations and an underground Interstate Hydrogen Pipeline System that will be able to carry superconducting high-voltage transmission lines as well as the hydrogen fuel that will be made from the sun, wind and water. It is worth noting that photosynthetic green plants on the earth have been successfully extracting hydrogen from water with sunlight on a global scale for over 3.5 billion years.

Given the vast land and offshore resources of the U.S., this reindustrialization effort will transform the U.S. from being the world's largest debtor nation and energy importer into a multi-trillion dollar hydrogen energy exporter. And because solar-sourced hydrogen is both inexhaustible and pollution-free, it will fundamentally eliminate many of the most serious economic, environmental and related healthcare problems with technologies that could have been mass-produced in the 1920s. This underscores the fact that the obstacles to this "transition of substance" to sustainable prosperity without pollution are not technical or economic -- they are political.

A Buyout, not a Bailout

Given that none of the private banks, investors, oil or other companies ever bail any one out, and given that the U.S. government is now over \$13 trillion in debt and is on the hook for some \$50 trillion in unfunded liabilities, with no end in sight, if the taxpayers are going to spend literally trillions of dollars to save these private sector companies, the taxpayers should own the assets. The \$8 trillion dollar investment in a Solar Hydrogen Economy will generate over \$1 trillion annually in income for just the U.S. market, and twice that value if the export potential is tapped, providing a "renewable rate of return" with technology that will last indefinitely and the only fuel that displace all fossil and nuclear fuels worldwide forever.

While there are those who will say that such public ownership is "socialism," at least the financial benefits would go to the majority of American citizens rather than to a tiny handful of wealthy individuals and self-serving bankers who typically earn more than \$100 million annually. Even the President of the United States only earns \$400,000 annually, and bankers, unlike the automotive executives, are simply money managers who don't produce anything, except unprecedented profits for themselves.

This current "Robin Hood in Reverse" system provides billions of dollars in bonuses for the financial executives when things go well, and billions of dollars in bailouts when they fail, all of which are paid for by the middle class and their descendants, which will get none of the benefits. What the taxpayers will be left with is a dollar that is increasingly worthless. The value of the dollar has fallen by over 50% since 2000 -- and that was before the major investment banks on Wall Street collapsed. The Chinese financial ministers have indicated they have no interest in bailing out the U.S., and as such, the Fed has chosen to simply print money, which was not even done in the great depreciation because of the obvious implications for hyperinflation and chaos. Make-work jobs didn't have much of an impact in the 1930's and it's doubtful that they will have much of an impact now. What the U.S. now desperately needs is to develop trillions of dollars in wealth generating activities on a renewable basis with technologies that will work in harmony with the earth's biological life-support systems. This is exactly what the Phoenix Project plan will accomplish on a global basis with wartime-speed.

We have repeatedly tried to get this message to the Obama administration, with no luck. As such, they continue to waste time and money on an array of make work jobs and phasing out SUVs instead of simply modifying them to use hydrogen. If ever there was a need for both a national and international reindustrialization effort -- that time is now. The only question is whether the trillions of dollars in returns should go the American taxpayers, or the private oil and other energy companies that have ignored the scientific warnings about peak oil and climate change and done nothing to make such a "transition of substance" a reality.

The Answer is Blowing in the Wind

Hydrogen can be made from water with any source of electricity, and all homes, businesses and gas stations have both water and electricity from an infrastructure perspective. However, half of the electricity in the U.S. comes from burning coal, which already emits hundreds of tons of carbon, radioactive isotopes and mercury annually, which directly contributes to the epidemic of autism, and a wide-range of other health care problems. If coal were to be gasified for hydrogen production on a scale to displace oil and natural gas, the 250-year supply would be consumed in less than 20 years, and the impact from strip mining, mercury contamination and climate change would be devastating. As such, making "dirty" hydrogen from fossil and nuclear fuels that are highly polluting and rapidly diminishing is no solution.

Any solar or geothermal technology that generates electricity can make hydrogen from water. The important question is cost. Wind systems now produce electricity for less cost than new solar, fossil fuel or nuclear systems, yet they currently generate less than one percent of the current energy demand in the U.S. This is because the winds (and most other solar resources) are intermittent in nature, which means they typically only operate about 30% of the time, and the winds often blow at night when the power is not needed. There is also a lack of transmission space on the existing electrical grid systems nationwide for any new power plant projects. However, these three obstacles are all eliminated if hydrogen is made from water with electricity that is generated from the wind and other solar technologies.

Unlike electricity, hydrogen can be stored and delivered to national and international markets by cryogenic tanker trucks, ships or underground pipelines that can also be engineered to transmit electricity as well as the hydrogen. Moreover, hydrogen made from the wind and water is a carbon free combustion fuel that is inexhaustible, which is why it is indeed a "silver bullet" solution that can permanently displace the use of fossil and nuclear fuels worldwide. The remaining oil and other fossil fuels can then be used as critical chemical feedstocks for the production of fertilizer, pesticides, plastics, medicines and food (i.e., it now takes ten calories of fossil fuels to make one calorie of food). Once it is known that hydrogen can be made from the wind and water for less cost than gasoline and other hydrocarbon fuels, every existing vehicle can be modified to use hydrogen as well as gasoline or ethanol with the flip of a switch. Several thousand vehicles were modified in this way in Germany and England in the 1930's, including a number of submarines and torpedoes, and BMW has been working on the same principal for the past 25 years, only using liquid hydrogen, which most closely resembles gasoline from a perspective of performance, fuel storage volume, weight and vehicle range.

Healthcare Cost Considerations

Given that Americans are now spending approximately 4 times as much on health care as they do energy, the health care implications are also profound. Given that the air coming from the exhaust of a hydrogen-fueled engine is actually cleaner than the air that enters the engine, millions of Americans would no longer be forced to be exposed to contaminated air, water and food. Hydrogen made from the wind and water emits pure water vapor as its combustion byproduct, which means once vehicles are fueled with hydrogen, urban areas will have crystal clear air even in rush hour traffic. The micron-scale carbon particles emitted from burning fossil fuels are able to get deep into the lungs, which cause respiratory disease, strokes and heart attacks, which is why a transition to a Solar Hydrogen Economy would save hundreds of billions of dollars in annual health care costs.

Ancient mountain ecosystems are now routinely destroyed for a few days worth of coal, which when burned emits hundreds of tons of mercury annually. A *Time* magazine article on mercury (Mercury Rising, September 11, 2006), documented that this highly toxic metal is not just in seafood, but is showing up everywhere, including in polar bears in the Artic -- and pointed out that mercury is much more toxic than most people think. Mercury not only causes serious damage to the brains of unborn infants and young children, which is no doubt a primary factor in the explosion of autism in children, but hundreds of millions of adults and other animals worldwide. If these health care and other environmental costs were factored into the cost of fossil fuels, they would have been phased-out many decades ago.

The Obama Administration

Both Barack Obama and John McCain supported the blank check bailout as well as ethanol, nuclear power and so-called "clean" coal as solutions in the campaign, when in fact these technologies create far more problems than they solve. Like oil, uranium 235 is a rapidly diminishing resource, and according to the NRC, every reactor in the U.S. is now suffering from serious level of stress corrosion in the primary reactor cores, making them ticking time bombs, and the nuclear wastes have been leaking and out of control for many decades. Although ethanol has received most of the attention in the news media, the Congress and investment community, according to the National Academy of Sciences, even if all of the corn in the U.S. was used to produce ethanol, it would only displace 12% of the gasoline now used. Moreover, ethanol is not renewable because it erodes the soil 18 times faster than it can recover, and it typically requires more energy from fossil fuels to make ethanol from corn than the ethanol will generate when it is used as a fuel.

Professor Paul Krugman
Princeton University
December 28, 2008
Page 4 of 4

In addition, ethanol still produces significant levels of carbon emissions as well as the toxic emissions of acetaldehyde and other carcinogenic aldehydes that are actually increased when compared to using gasoline as fuel. Moreover, a report in *The New York Times* (January 19, 2008) documented that even the relatively small amounts of ethanol and other biofuels now being produced are already having a devastating impact on food prices worldwide, which is now adversely impacting several billion desperately poor people. It is also important to note that while it takes just over 50 kilowatts of electricity and 2 gallons of water to make an equivalent gallon of gasoline in the form of liquid hydrogen, it takes 18 gallons of water to make a gallon of gasoline from oil, and over *12,000 gallons of water are needed to make a gallon of ethanol from corn*. It is why the focus on ethanol seriously worsens the environmental problems and simply wastes time and money.

Climate Change Concerns

The Phoenix Project is the only plan proposed that will comply with the specifications and warnings of the senior scientists at NASA and the National Academy of Sciences, which clearly state that global CO₂ levels, which are now at 385 ppm (parts per million), need to be less than 300 – perhaps much less – in order to minimize the impact of the global famines that have already begun. The global ocean ecosystems are now more than 90% dead and the remaining fish are contaminated with mercury from the coal plants. The major forest ecosystems in the Rocky Mountains and Cascades are being destroyed because the warmer temperatures, and the bees, which are critical pollinators, are also disappearing, along with the bats and frogs. Moreover, the tundra and methane ice crystals in the Arctic are now rapidly melting, which could release 100 times more carbon into the atmosphere than is now generated from burning fossil fuels, which underscores the need to shift to a Solar Hydrogen Economy with wartime-speed.

All of these profoundly serious problems would be virtually eliminated if the Phoenix Project Plan was implemented, and yet the American public and the Members of Congress are completely unaware of the option. You are in a unique position to change that.

There are two 2-minute videos and one 45-minute video documentary of the Phoenix Project book that is available at no cost on the PhoenixProject.net website. Please note that at the end of the video (after the credits), there is an ABC News report by the late Peter Jennings about John Lorenzen, a Midwest farmer with a sixth grade education who built his own wind-powered hydrogen production system in his barnyard workshop from spare parts, and he modified his pickup truck to use the hydrogen fuel he made from the wind and water. What John Lorenzen did on his farm is what now needs to be done on a global scale while there is hopefully still time to make a difference in resolving the exponentially worsening economic, energy and environmental problems.

I very much look forward to your thoughts.

Sincerely,

Harry Braun
CEO, author and principal investigator
Phoenix Project Foundation
5093 Mountain Gate Circle, Lakeside, Arizona 85929
Telephone: 928-532-0008 Cell: 602-757-2703
hb@PhoenixProjectFoundation.US



Harry W. Braun III
Technical Analyst, Author, & Principal Investigator

Harry Braun has been working as an energy and environmental analyst for the past 35 years. He is the founder and Chairman of the Phoenix Project Foundation (PhoenixProjectFoundation.US), which is a non-profit, scientific educational organization that is focused on educating the general public about the critical interrelationships of exponential growth, energy, the economy, and the environment, as well as the origin of life, protein evolution, photobiology, molecular biology and U.S. foreign policy.

Harry is the author of numerous technical papers, as well as *The Phoenix Project: Shifting from Oil to Hydrogen*, a 360-page book that provides a scientific overview of the origin of matter and life in the known universe, how the “big bang” created hydrogen atoms, which gravity condensed into the stars, which then emitted the electromagnetic spectra that served as the spark for the origin and evolution of life on the Earth. The book also provides an overview of how the U.S. and other countries can rapidly shift from non-renewable fossil and nuclear fuels to renewable solar hydrogen production systems, which will resolve many of the most serious economic and environmental problems. The book reviews both the positive and negative aspects of exponential growth, which explains why humanity is on the threshold of both a nanotechnology utopia and an ecological oblivion. It is why we on *Spaceship Earth* are all like passengers aboard the *Titanic*, and there is only a limited amount of time left to “change course.” Although hydrogen is often mentioned as the “Holy Grail” of all energy sources, Harry Braun is the only technical analyst who has provided a specific plan for how this “transition of substance” can happen by 2020 by mass-producing wind and other solar powered hydrogen production systems, and modifying every existing vehicle, appliance and power plant to use hydrogen fuel.

Harry is also Chairman of Sustainable Partners LLC (SustainablePartners.com), a systems integration firm that is involved in a number of renewable energy development projects, including a \$180 million wind farm project in New Mexico. Harry is also Chairman of the Phoenix Project Political Action Committee (PhoenixProjectPac.US), which is focused on the political aspects of helping to organize Hydrogen Hearings in the U.S. Congress, which will be a prerequisite for the passage of Fair Accounting Act and Photobiology legislation that Harry has proposed in his book. The Fair Accounting Act legislation is the “trigger mechanism” for shifting to the solar hydrogen economy because it will provide the financial incentives for oil and other energy companies to rapidly become solar hydrogen companies, with an energy resource that will provide a renewable rate of return because it is both pollution-free and inexhaustible. The Photobiology legislation is intended to establish specific guidelines for the lighting industry with respect manufacturing general purposing lighting that will simulate the spectral wavelengths of the natural electromagnetic radiation that is found in sunlight.

Harry received a Bachelors degree from Arizona State University in 1971. His undergraduate work was in history and general science, while his graduate work focused on evolutionary biology and anthropology. His post graduate research has been in the areas of energy technologies and resources, photobiology, molecular biology and protein evolution. Harry has been an Advisory Board Member of the International Association for Hydrogen Energy (iahe.org) since 1981. This international peer-review professional society, which is comparable to the American Medical Association, is composed of hundreds Ph.D.-level scientists, chemists and engineers from over 85 countries. Harry ran for Congress in 1984 against John McCain, and was an independent presidential candidate in 2004 (please refer to the BraunforPresident.US website to review his campaign platform).