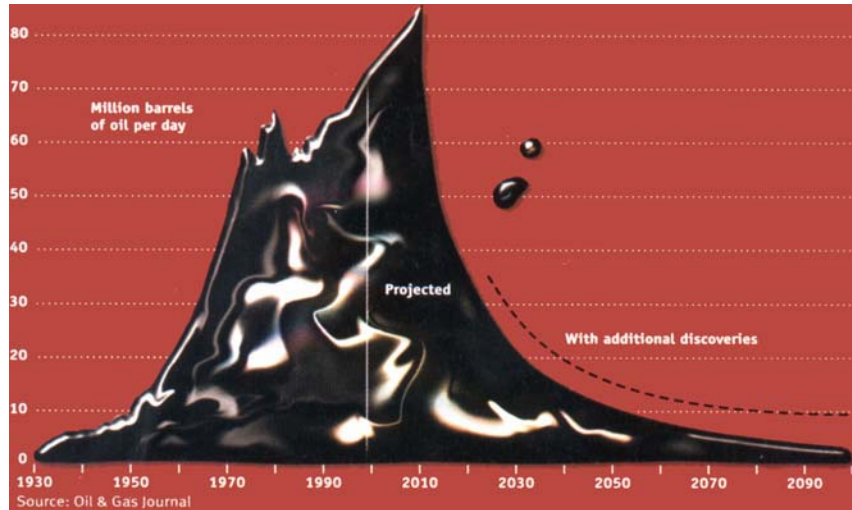

SPI Wind Hydrogen Business Venture Executive Summary



*Making hydrogen from the wind & water:
Providing "sustainable prosperity
without pollution"*



Sustainable Partners International
6128 North 28th Street, Suite 100, Phoenix, Arizona 85016
Telephone: (602) 955-4555 Fax: (602) 955-5444
Email: hb@SustainablePartners.com

Sustainable Partners



Note that the Sustainable Partners logo pictured above represents the hydrogen molecule. The hydrogen atom is the simplest, lightest and most abundant element in the known universe, containing only one proton and one electron, but it virtually never exists alone. Rather, it chemically creates a sustainable partnership with another hydrogen atom, forming a molecule, which is referred to as H_2 .

SPI Wind Hydrogen Business Venture



Executive Summary

**The SPI Wind Hydrogen Business Venture
is a plan to displace oil and other fossil & nuclear fuels
with hydrogen made from the wind & water**

Business Case Overview

Sustainable Partners International LLC (SPI) was the original developer of one of the largest wind projects in New Mexico, and is now focused on securing the necessary land and water resources to install a network of wind-powered hydrogen production systems that will be able to generate liquid hydrogen for less than \$2.00 per equivalent gallon of gasoline. Hydrogen made from the wind and water is a pollution-free, zero carbon emission “universal fuel” that can power any existing vehicle (including aircraft), appliance or power plant.

Wind systems now generate electricity for less cost than any other renewable technology, or new coal, natural gas or nuclear facilities. However, wind systems now generate less than one percent of the energy in the USA because wind resources are intermittent (i.e., they only operate 20 to 40 percent of the time), and most of the electrical transmission systems in the USA are now at capacity, which means there is not space available on the existing transmission lines for large new energy projects. These problems are eliminated, however, if the wind systems are engineered to extract hydrogen and oxygen from water. Moreover, if the systems are mass-produced on a gigawatt-scale to displace oil and other fossil fuels, the resulting liquid hydrogen will be produced for approximately \$2.00 per equivalent gallon of gasoline. The wind resources in the USA could permanently displace not just imported oil, but all fossil and nuclear fuels, which is the primary objective of the SPI Wind Hydrogen business venture.

Although analytical wind hydrogen studies have been completed by investigators at Stanford University and the U.S. Department of Energy’s National Renewable Energy Laboratory, no company has yet organized an effort to mass-produce wind systems for large-scale hydrogen production. Although SPI will enter into negotiations with several major wind turbine manufactures, including Vestas and Mitsubishi, it is anticipated that General Electric will be selected as the preferred vendor because of its formidable technical and financial assets. Given that more and more people are competing for fewer and fewer fossil fuels, the longer this transition to a renewable hydrogen economy is delayed, the more expensive it will be. Moreover, Dr. Jim Hansen, NASA's chief climate scientist, has warned that the use of oil, coal and other fossil fuels must be phased-out within 10 years if irreversible damage to the earth's climate and life support systems is to be avoided. The SPI wind hydrogen business venture is a plan that can do exactly that.

Amount of Capital Sought

As the project developer, SPI is seeking to sell up to 30 percent of its Project Development Fees (i.e. two percent of the capital costs) and Royalties (i.e., two percent of the energy sales) for \$1 million per one percent (i.e., \$30 million). With a minimum investment of \$100,000, the initial investors in SPI will be provided with the same return as SPI or its largest investors. Approximately 1/3 of the funds will be used to manage the project; 1/3 will be used to secure the necessary land and water resources; and 1/3 will be used to characterize the selected wind sites with metrological test towers. SPI seeks to secure a minimum of \$1 million to \$2 million per year for the first 3 years in order to manage the project. However, SPI is also seeking the additional capital needed to purchase land when ever possible, and to retain the appropriate legal and technical and environmental personnel to acquire long-term leases on federal land that is managed by the Bureau of Land Management.

The Answer is Blowing in the Wind

The USA is increasingly dependent on oil that is now supplied by increasingly unfriendly governments of Saudi Arabia, Iran, Iraq, Venezuela, and Russia. From a technology perspective, a fundamental solution to the reliance on oil and other fossil fuels could have been implemented in the 1920's, which is to implement a solar hydrogen economy by making the hydrogen from water with electricity that is generated from the wind and a mix of other renewable energy resources. Although wind systems now generate the least expensive electricity, many conventional energy analysts have dismissed wind systems as a major component of the energy solution because wind resources are intermittent in nature. Indeed, most wind systems only operate for about 20% to 40% of the time, and no one can predict when the wind will be blowing at any given time. This lack of "dispatchability" is why utilities can only have a limited number of wind systems connected to their transmission systems, and it is one of the primary reasons why wind systems contribute less than one percent of the total energy requirements in the U.S. However, bankers finance wind machines because while the winds may be intermittent, the wind power that will be generated over any given month is a highly predictable event, as any sailor knows.

According to a detailed study by two Stanford University engineering professors, Cristina Archer and Mark Jacobson, who evaluated data from thousands of wind sites across the USA, the wind is always blowing somewhere, and if a national wind energy system were connected together, the intermittent nature of the winds would become irrelevant. Their study was funded by NASA and the National Science Foundation and the initial results were published in the Journal of Geophysical Research in 2003. However, the intermittent nature of the wind is irrelevant if the electricity generated is used to generate hydrogen from water, which is what every green photosynthetic plant has been successfully doing with no pollution on a global scale for the past 3.5 billion years. The resulting hydrogen is renewable and pollution-free, and because it is a "universal fuel," it can be used to fuel all of the *existing* internal combustion engines and existing power plants indefinitely.

Plan A, B or C

Plan A of the SPI Wind Project will minimally involve having General Electric finance and build a wind hydrogen manufacturing complex that will be able to generate 10,000 five megawatt units per year. In the first 10 years, over 70,000 units would be installed for a capital investment of approximately \$215, plus \$ 5 billion for hydrogen pipelines. Plan A would generate over 356 gigawatts over the first 10, which would generate approximately \$35 billion in annual revenue, and provide enough hydrogen to fuel all of the 30 million vehicles in California and New Mexico. However, given the concerns of Dr. Hanson and the other scientists at the National Academy of Sciences, it is anticipated that Plan A will rapidly evolve into Plan B, which involves having GE finance and build a wind manufacturing facility capable of producing at least 250,000 units per year. That will allow over 2 million wind powered hydrogen production systems to be operational within 10 years, which will make the USA energy independent of all fossil and nuclear fuels. Plan C assumes SPI will only participate in 1% of Plan B (i.e., 100 gigawatts).

Return on Investment

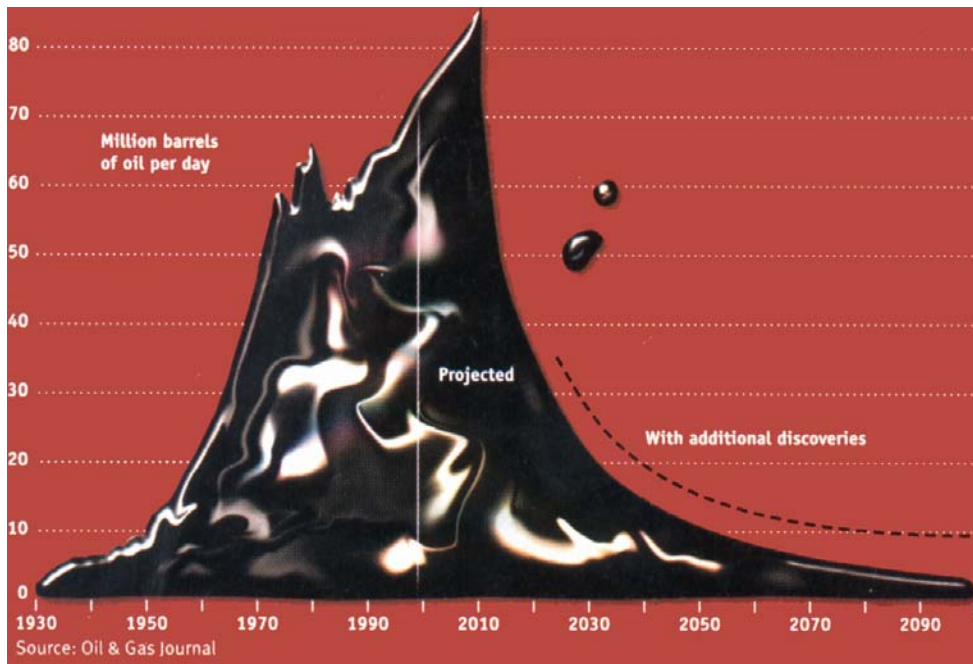
SPI's project development fees will come from the capital costs and royalties on the sales of energy and chemicals sold in the form of hydrogen and oxygen. The return on investment calculations, which are anticipated to be over 40%, are based on the revenue stream that will flow from these project development fees. Moreover, there is virtually no technology risk because GE will be responsible for building the systems, and providing up to 80% of the project financing. In Plan A, a \$10 million investment for 10% of the SPI development fees and royalties will generate a return of over \$500 million during the first 10-years of the project. In Plan C, a \$10 million investment will generate a 10-year return of \$143 million, providing a ROI of over 30%. Unlike oil or natural gas wells that will eventually be depleted, the SPI wind-powered hydrogen production systems will last indefinitely, with a fuel that is inexhaustible, thereby providing a renewable return on the investment.

National Insecurity

Prices for oil, gasoline, natural gas and coal are at the highest levels in history, and for those who think it's dire now, just wait. As the graph below prepared by the *Oil & Gas Journal* shows, there is a dramatic drop off in oil production coming that will have a profoundly negative impact on the global economy, and virtually every product produced and transported. It's like being on a roller coaster that is slowly cresting the hill just before the "exponential plunge" begins. There are plenty of warning signs. According to a page-one story in *The New York Times*, (2/24/04), most of the major oil fields in the Middle East are over 50-years old and have already begun to decline in their annual production. It is only a matter of time before the production begins its "exponential plunge" phase, which will result in a financial tsunami for the global economy and agricultural systems that are now highly dependent on fossil fuels for fertilizer production and pesticides (i.e., modern agriculture requires ten calories of fossil fuels to create one calorie of food). Oil is also a critical feedstock for the production of plastics, polymers and medicines.

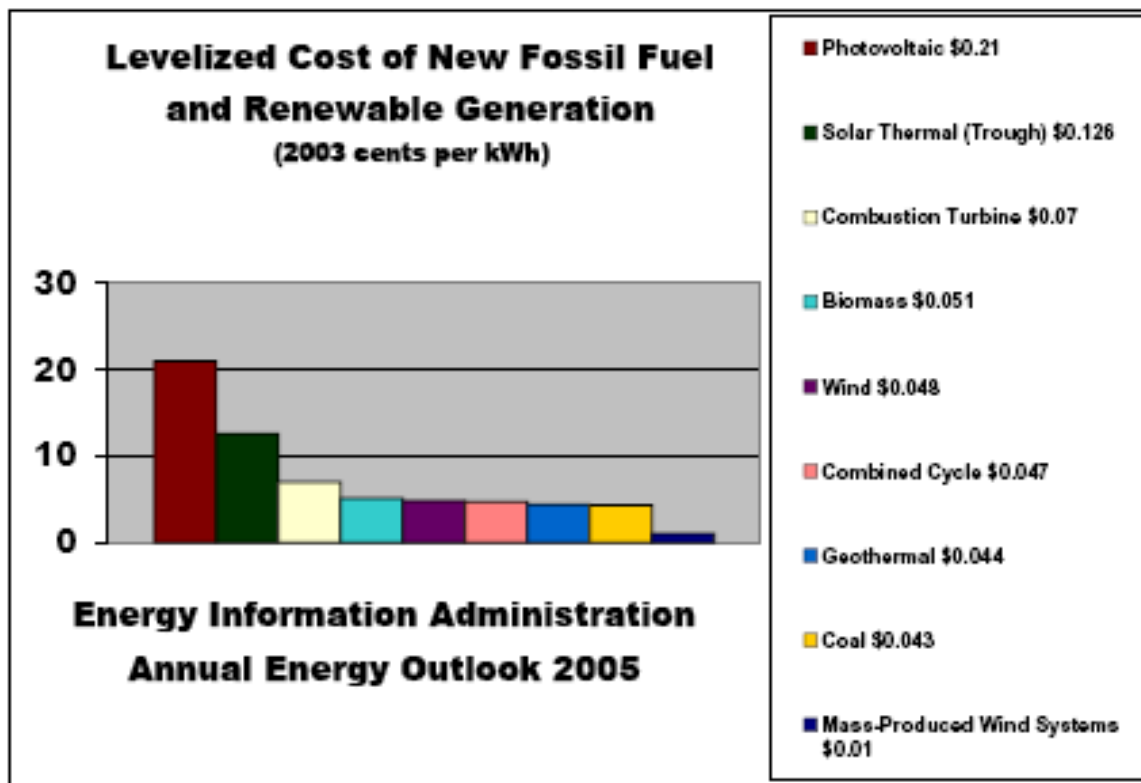
Peak Oil: The Exponential Plunge

The net result of more and more people competing for fewer and fewer reserves.



Proven Reserves Are Not Proven

The only hard evidence of oil or natural gas in a well is how much is actually produced from a well at any given time over the bell curve production cycle of the reserve. Data from ChevronTexaco for six consecutive years indicated that their proven reserves increased by 14%, while their actual production declined by 15% over the same period. Shell also admitted in 2005 that it overstated its proven oil and gas reserves by 22%, and a recent survey from the International Energy Agency confirmed the decline in production by the world's major oil companies. The Middle East has two-thirds of the world's remaining proven reserves -- except that the reserves are not "proven." Saudi Arabia views its oil reserves as state secrets, and as such, they do not disclose details about their reserves or the condition of their oil fields, although in a recent ABC News story (March 17th, 2005) they conceded they were indeed running out of oil. While some believe it is possible to drill our way out of the problem, Lee Raymond, the former CEO of ExxonMobil stated that with less than 2 percent of the global oil reserves, it is simply impossible for the U.S. to be energy independent with fossil fuels. The only way to alter this outcome is to change the equation by shifting to renewable hydrogen energy technologies and resources that are inexhaustible, which is the fundamental objective of the SPI Wind Hydrogen Business Venture.



As the above graph prepared by the U.S. Energy Administration shows, wind systems generated electricity for about 4.8 cents/kWh in 2003, which was less expensive than any of the other renewable energy options. Moreover, given the sharp price increases for coal, natural gas and oil since that time; wind systems now generate electricity for less cost than any other energy option. Moreover, if they are mass-produced on a scale to displace oil and other fossil and nuclear fuels, the electricity costs from wind systems will be expected to be reduced to one-cent/kWh, which would allow liquid hydrogen to be generated for less than \$2.00 per equivalent gallon of gasoline.

Approximately 2 million 5 MW wind systems would make the USA energy independent of not only imported oil, but all the fossil and nuclear fuels that are now used. While that may sound like a large number, from a technology perspective, wind-powered hydrogen production technologies are no more difficult to build than automobiles, and over 6 million of the 17 million automotive vehicles sold in the U.S. annually are still manufactured in the USA. Millions of high-quality jobs would be created as the USA leads the world into a wind-powered hydrogen economy. The capital investment for the 2 million wind systems and the related hydrogen storage and pipeline transmission systems is expected to be approximately \$6 trillion, but the systems would generate over \$1 trillion annually in energy and chemical sales, allowing the \$6 trillion capital investment to be recovered in about six years, with equipment that will last indefinitely.

It is also significant to note that while gasoline and other non-renewable fossil and nuclear fuels will continue to get more expensive in the future as the remaining reserves are consumed, the cost of manufacturing hydrogen from the wind and water will continue to be reduced in the future as the technology is refined. It is why wind-powered hydrogen production systems are indeed the “silver bullet” that will be able to provide the U.S. with the capability of becoming not only energy independent of fossil and nuclear fuels, which are highly polluting and rapidly diminishing, but a world-class energy exporter of hydrogen, a pollution-free fuel that is inexhaustible.

What are SPI's Expected Future Funding Requirements?

The relatively large project debt and equity capital investments for the SPI Wind Hydrogen Projects are anticipated to come primarily from General Electric Capital Corporation, and large energy companies such as Edison Capital, ChevronTexaco and/or other major oil, utility, and/or energy companies. What SPI initially requires is the capital needed to manage the business venture, and acquire the needed land and water rights and the metrological test towers to verify the wind data at the sites. These initial project expenses are critical, which is why SPI is prepared sell up to 30% of its project revenues for \$30 million. After each of the gigawatt-scale project is completed, SPI initially anticipates that the controlling interest in the project will be acquired by companies such as Edison Mission Energy or ChevronTexaco. Eventually, SPI anticipates retaining the controlling interest in its gigawatt-scale projects.

What is the Investors Expected Exit Strategy?

SPI anticipates that its initial investors will recover their investment in year 3 or 4 from the initial SPI Project Development Fees. Moreover, any initial investment in SPI will be returned to the investors before SPI will receive any income from its wind hydrogen business venture. Moreover, given the renewable energy nature of the SPI Wind Hydrogen wind hydrogen projects, its investors will be provided with renewable rate of return for as long as the SPI projects continue to operate. In this regard, SPI's long-term position with the project is attached to the land acquisition agreements, which is why whenever possible, SPI will seek to purchase the land and water needed for the wind turbines and related hydrogen production, storage and transmission systems. It is anticipated that any initial investment in SPI will be recovered in year 3 or 4 from the SPI Project Development Fees, and when the annual royalties over the first 10 years are included, a 10-year return on investment (earnings before interest, taxes, depreciation and amortization) of over 40 percent is anticipated. This is in contrast to the ROI for most energy projects, which is typically in the range of 10 to 15 percent.

What about the Hydrogen Pipelines and Other Infrastructure Issues?

With the SPI plan, hydrogen fuel will be made from electricity and water, which is found in virtually every home and service station. According to a study by General Motors, every service station in the USA could be modified to include a hydrogen pump and storage system for approximately \$20 billion, which will be paid for by the oil companies, not SPI. And rather than waiting for fuel cells, which may not be practical for decades, SPI anticipates that once it is demonstrated that liquid hydrogen can be generated for less cost than gasoline, every existing automotive vehicle can be quickly and inexpensively modified to use hydrogen as well as hydrocarbon fuels like gasoline or ethanol with the flip of a switch.

The more significant infrastructure issue involves installing an Interstate Hydrogen Pipeline System that would be able to carry both liquid hydrogen and electricity nation-wide with ultra-high efficiencies. Investigators have been working on this concept of a continental "SuperGrid" system since the 1960s, and in a recent article published in *Scientific American* (July 2006) the details of such a system are provided. No new technology is required to build such a system that is now being refined by investigators at the Electric Power Research Institute (EPRI), a highly respected organization that is funded by hundreds of utilities in the U.S. Moreover, the EPRI investigators, led by Paul M. Grant, who received his Ph.D. in physics at Harvard University, have concluded that such a system could compete economically with a natural gas pipeline or conventional overhead high-voltage transmission lines. As EPRI investigators have pointed out, it is important to develop such a system as soon as possible because the total generating capacity in the U.S. has increased by about 25% in the past 5 years, whereas the existing grids have only increased by 3.3%. As such, the existing grids have reached the point of maximum loading, which is why such a SuperGrid system is needed even without the anticipated development of the gigawatt-scale wind-powered hydrogen production systems planned by SPI.

Has SPI Raised Any Money Previously?

SPI was the original developer of the San Juan Mesa Wind farm, what is now the largest non-utility wind project in New Mexico. SPI sold the controlling interest in the project to Catamount, a subsidiary of the Vermont Public Service Company in 2000, and when Phase I of the project was completed in 2005, the controlling interest was acquired by Edison Mission Energy, which owns Southern California Edison. The Development Fees and Royalties to SPI will exceed \$4 million over the first 30 years of the project.

What Milestones will be Accomplished with this Funding that will enable SPI to Secure Additional Capital or Achieve Liquidity?

- The land and water will be secured from private land holders and the States in which SPI projects are planned, including the land needed for hydrogen pipelines systems.
- Metrological test towers will be installed to characterize and validate the wind sites for project financing purposes.
- The wind turbine production schedule will be finalized.
- Wind energy and electrolysis equipment manufacturers will be selected.
- A Prime Contractor to install the wind systems will be selected.
- Hydrogen fuel purchase contracts will be secured.

With the elements listed above in place, project financing can be secured from a consortium of financial and investment groups, which are anticipated to include General Electric, Edison Mission Energy, ChevronTexaco or other oil companies and/or customers for the hydrogen, including Shell or BP. With respect to capitalization, the SPI business venture has two basic financial components:

- A. The first investment component involves securing the necessary land and water resources and characterizing the wind sites with metrological test towers. This is anticipated to require from \$500,000 to \$30 million, depending on whether the land is public or private; whether it is leased or purchased; and how many acres are secured. It is anticipated that this initial investment will be recovered in year 3 or 4 from the SPI Project Development Fees.
- B. The SPI project development fees will be generated from the second financial component of the business venture, which involves large capital investments that are anticipated to be made by General Electric and a consortium of utility and oil companies to build the wind-powered hydrogen production, storage, and transmission systems. Plan A (The plan to fuel the California and New Mexico fleets of 30 million vehicles) requires about 350 gigawatts of installed wind capacity, which is expected to have a capital cost of approximately \$220 billion (i.e., \$22 billion annually for 10 years). Approximately 20 billion gallons of hydrogen fuel (i.e., 120,000 Btu/gallon) would be generated annually at \$2.00 per gallon, providing \$35.6 billion in annual revenue, thereby recovering the \$220 billion capital investment in about 6 years. Plan B would involve building 2 million 5 MW wind systems that would generate approximately \$1 trillion annually in fuel sales, and require something on the order of a \$6 trillion investment (i.e., \$600 billion annually for 10 years). The more conservative Plan C assumes SPI will only participate in 1% of the Plan B effort (i.e., 100 gigawatts).

What are SPI's Most Important Assets?

The most important assets of SPI are the technical and business experience and insights of its founder and CEO, which includes identifying the major property owners in the wind-rich areas of New Mexico, Texas, Oklahoma and other western states. Once the land and related water rights have been secured by SPI's real estate acquisition team, SPI's long-term interests in its wind projects will also be secured.

There are no significant technology, resource or financial barriers to SPI's objective of installing over 10,000 gigawatts of wind-powered hydrogen production systems by 2010 (i.e. Plan B). All of the systems could be located in just a few states, or offshore as "windships." The \$6 trillion capital investment will generate approximately \$1 trillion annually in revenues, with equipment that will last indefinitely, and a resource that is both pollution-free and inexhaustible..

What significant obstacles are there?

The most significant obstacles are as follows:

1. **Water.**

New Mexico and much of the Southwest is experiencing a serious drought, but the water requirements for the SPI projects are modest compared to what is typically required for agriculture. Only 2.5 gallons of water is needed to electrolytically generate an equivalent gallon of gasoline in the form of hydrogen (i.e., 120,000 Btu). By contrast, it takes 18 gallons of water to make a gallon of gasoline from oil and over 8,000 gallons of water to make an equivalent gallon of corn-based ethanol. The SPI wind-powered hydrogen production systems will require less than 4% of the 3.5 million Acre Feet (AF) of water that is now used for agriculture in New Mexico to fuel all of the vehicles in California. Moreover, approximately one million AF of water would be needed to generate the 140 billion gallons of gasoline and other hydrocarbon fuels that are now used in the U.S. annually by over 133 million vehicles. This is in contrast to the 7 million AF of water that is currently needed to manufacture gasoline from crude oil, and if corn ethanol were to be used, over 3.5 billion AF of water would be needed annually, which is about 6 times the total amount of water that is now used in the USA annually.

2. **Engine Conversion Kits.**

In the 1930's, thousands of engines and vehicles in Germany and the UK were inexpensively modified to use hydrogen as well as conventional fuels with the flip of a switch. There are a number of company's that now have similar conversion kits available, and all of the major automotive manufacturers have developed flex fuel systems that allow vehicles to use multiple fuels. Once it has been demonstrated to elected officials and automotive manufactures that hydrogen can be made in the USA from the wind and water for less cost than gasoline or ethanol made from imported oil, every existing vehicle will rapidly be modified to use either fuel.

Who is the Competition, and Why is SPI's Solution Better?

Corn-based ethanol is now receiving the bulk of media attention and investments, yet independent technical analysts have documented that it is not renewable because it takes more fossil fuels to make the ethanol than it provides as fuel; it causes the soil to erode 18 times faster than it can reform; and it could never displace fossil fuels because of its vast land and water requirements. (Please refer to the attached 2-page summary "The Many Problems with Ethanol from Corn: Just How Unsustainable is it?" which summarizes the technical analysis by engineering investigators at Cornell University, the University of California at Berkeley, Argonne National Laboratory and U.S. Department of Agriculture. There are a number of wind energy development companies, but at present, all of the existing wind systems are configured to produce grid-quality electricity. Even the engineers at General Electric are only beginning to explore this hydrogen production market, and at present, SPI is the only company that is currently focused on developing gigawatt-scale wind-powered hydrogen production systems, which are the only systems that can make the USA energy independent of fossil and nuclear fuels by 2020.

What are the Other Factors that Investors Tend to Overlook?

1. A recent congressionally authorized report by the National Academy of Sciences has documented that the human induced global warming process is indeed occurring because of the increasing use of fossil fuels, and that the earth is now warmer than it has been for over 2000 years. As a result, the Artic tundra and methane hydrates in the oceans are now beginning to melt, which will dramatically accelerate the global warming process. Such climate change is common in the earth's history, but such events have always resulted in mass-extinctions, and tragically, a new mass-extinction event is now underway.
2. SPI has confirmed its hydrogen production cost numbers with Dan Rabun, a chemical engineer and business development manager with Air Products & Chemicals, the largest hydrogen production company in the USA, and Bill Leighty, who received his electrical engineering degree from Stanford University and is now CEO of Alaska Applied Sciences. In addition, J. Levene and his colleagues at DOE's National Renewable Energy Laboratory have also confirmed SPI's wind hydrogen production numbers in a 2006 paper "Wind Energy & Production of Hydrogen and Electricity.
3. The exponential nature of the energy and environmental problems (i.e., more and more people are competing for fewer and fewer resources), dictates the need to shift to renewable energy technologies with wartime-speed. As the cost of oil sharply increases, it will dramatically increase the cost of mass-producing the wind and other renewable energy systems as well as the resulting hydrogen that will be produced from the systems.
4. According to an investigative report published in the New York Times in 2/24/04, all of the major oil fields in Saudi Arabia and other Middle East countries peaked in their production output several years ago, and soon the production output will fall off dramatically.
5. In order to make the transition to renewable hydrogen systems economically viable, electricity costs have to be reduced to one or two cents per kWh, which can only be done at present by mass-producing wind energy systems.
6. 100-million year old mountain ecosystems are now routinely destroyed for a few days worth of coal, which when burned contaminates the atmosphere with tons of carbon and toxic mercury that causes permanent brain damage in millions of children. Moreover, coal prices have been sharply increasing in recent years, and if coal were used to make the hydrogen needed to power the USA, the 250-year supply would be consumed in less than 20 years. In spite of these horrific problems, there are now over 1,000 coal plants on the drawing boards that will require a trillion dollar capital investment.
7. When the SPI Wind Hydrogen Project is announced to the national news media, it will be a shot heard around the world. Congressional Hearings will soon follow, and a fundamentally different American energy policy will emerge that will be focused on redirecting investments away from fossil and nuclear fuels to building an interstate hydrogen pipeline system and modifying all of the existing vehicles and power plants to operate on hydrogen as well as conventional hydrocarbon fuels. It is also worth noting that New Mexico's Governor, Bill Richardson is a former energy secretary who is now running for president. Moreover, both of New Mexico's senators, Pete Domenici (R) and Jeff Bingham (D) serve on the Senate Energy Committee, and Senator Domenici is currently the committee chairman. While Senator Domenici is currently a strong supporter of fossil and nuclear fuels, such non-renewable resources will never be able to make the U.S, energy independent, or transform the state of New Mexico in to a world-class energy exporter. It is why the Congressional Hearings and media exposure is important because it will dramatically accelerate the "transition of substance" to a wind powered hydrogen economy.

Other Significant Investment Considerations

1. The winds over states like Texas, New Mexico or Kansas could displace all the fossil and nuclear fuels now used in the U.S. with wind-powered hydrogen production systems that are currently being developed by General Electric and other wind turbine manufacturers. Moreover, the wind resources at sea are even much greater, and they can be captured with advanced wind systems that are referred to as “windships.” The critical first step in the SPI wind hydrogen business venture is to secure the necessary land and water resources that will be needed for large-scale hydrogen production. The primary products sold will be hydrogen and oxygen, which will be liquefied and transported by cryogenic tanker trucks. As the volume of the hydrogen is increased, it will be delivered to national and international markets by cryogenic ships and pipelines, which will also be able to carry electricity as well as hydrogen and oxygen.
2. Wind systems now generate electricity for less cost than any other renewable energy technology, as well as conventional fossil fuel and nuclear technologies, and from a manufacturing perspective, wind systems are very similar to automobiles. As such, they can be rapidly mass-produced for large-scale hydrogen production, and the resulting hydrogen made from the wind and water will cost less than \$2.00 per equivalent gallon of gasoline. It is why \$3.00 per gallon was a needed market incentive. Hydrogen is the only “universal fuel” that can power every existing vehicle and power plant in the world with a carbon-free fuel that is inexhaustible. Moreover, all of the existing vehicles can be easily modified to use hydrogen, as well as gasoline or ethanol, but the primary obstacle is identifying where all of the hydrogen is going to come from at a price that is competitive with fossil fuels. While hydrogen can be manufactured from oil, coal and other fossil and nuclear fuels, this approach only exponentially worsens the energy supply and environmental problems.
3. Given that more and more people worldwide are competing for fewer and fewer fossil and nuclear fuel resources, the laws of supply and demand will dictate that energy prices will continue to rise exponentially. In addition to these powerful economic factors, there are more even more serious environmental factors that are exponentially worsening due to the increasing use of oil and other fossil fuels. The rate of melting of the polar icecaps is now occurring far faster than any one predicted even a few years ago, and the permafrost and methane hydrates are now beginning to melt, which will rapidly accelerate the global warming process. It is worth noting that the journal *Science* published an article in 2004 that surveyed 928 papers on climate change, which were published in peer-review scientific journals, and not one of the papers disagreed with the overwhelming scientific consensus that global warming is occurring, and that the use of fossil fuels was the primary cause. According to Special Report on global warming that was featured on the cover of *Time* magazine (April 3, 2006):

“Be Worried. Be Very Worried. Climate change isn’t some vague future problem – it’s already damaging the planet at an alarming pace. The debate is over. Global arming is upon us – with a vengeance. From floods to fires, droughts to storms, the climate is crashing.”

4. Given these economic and environmental problems, there is a genuine urgency to shift to renewable solar-sourced hydrogen energy production systems with wartime-speed. Indeed, Dr. James Hansen, NASA’s chief climate scientist, has warned that the industrialized nations need a 10-year plan to get off of carbon-based oil, coal and other fossil fuels if irreversible damage to the earth’s life support systems are to be avoided. The proposed SPI Wind Hydrogen Project is a plan that can do exactly that. It is certainly possible to scale down the manufacturing schedule, but given that energy costs impact every product produced, the longer the transition to a renewable hydrogen economy is delayed, the more expensive the transition will be. Moreover, once the U.S. energy requirements have been met, significant numbers of additional gigawatt-scale systems can be installed to export the hydrogen to international energy markets.



Harry Braun
Founder, Chairman & CEO

Harry Braun is the founder, Chairman and CEO of Sustainable Partners International (SPI). SPI (SustainablePartners.com), was the original developer of a \$250 million 185 MW Mesa Wind project in New Mexico, and the controlling interest in the project has been acquired by Edison Capital in 2005. Mr. Braun has been working as an energy and environmental analyst for the past 30 years, and is the author of *The Phoenix Project: Shifting from Oil to Hydrogen*, a 360-page book that documents how a renewable hydrogen economy can be implemented with wartime-speed. The book reviews both the positive and negative aspects of exponential growth, which explains why humanity is on the threshold of both a utopia of molecular medicine and nanotechnology as well as an ecological oblivion where major food productions will fail due to humanities increasing dependence on fossil fuels. Although hydrogen is often mentioned as the “Holy Grail” of all energy sources, Harry is one of the few technical analysts who has documented how a renewable hydrogen economy can be implemented before 2020 by mass-producing renewable wind and wave powered hydrogen production systems, and modifying every existing vehicle, appliance and power plant to use solar-sourced hydrogen fuel.

Prior to his involvement with wind projects, Mr. Braun was the founder, Chairman and CEO of Stirling Energy Systems, Inc., which was focused on commercializing solar Stirling technology that was developed by McDonnell Douglas and Kockums during the 1980s. Braun was responsible for acquiring the rights to the technology in 1990 and then negotiated an agreement with Boeing for them to serve as the prime contractor in a Department of Energy solar Stirling contract. The technical team Braun assembled also included Kockums, the major Swedish defense contractor who developed the Stirling engine for non-nuclear submarines, and AlliedSignal, which was considering manufacturing the Stirling engine. Although the solar Stirling system was proven to be three times more efficient than photovoltaic cells, its size (it is 40 feet tall), many moving parts and noise levels made it impractical for remote power applications. Moreover, even in centralized multi-megawatt utility applications, its cost of electricity was projected to be five times more expensive than that generated by wind systems, which meant the Stirling systems would not be practical for hydrogen production. As such, Braun left SES in 2000 in order to focus on the development of wind projects and advanced wind systems.

Mr. Braun received a Bachelors degree from Arizona State University in 1971. His undergraduate work was in general science, while his graduate work focused on 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 is composed of hundreds of scientists, chemists and engineers from over 82 countries. Braun served as the Democratic Candidate for Arizona’s First Congressional District in 1984. His opponent was John McCain. Mr. Braun founded the Phoenix Project Foundation (PhoenixProjectFoundation.US) in 2004, a non-profit, scientific educational organization that is focused on educating the American public about the critical interrelationships of exponential growth, energy, the economy, the environment, and U.S. foreign policy. He is also the founder of the non-profit, non-partisan, Phoenix Project Political Action Committee (PhoenixProjectPac.US), which is focused on passing a number of constitutional amendments, including a Fair Accounting Act that will phase out the use of fossil and nuclear fuels by factoring in the environmental, healthcare and military costs of using such fuels.