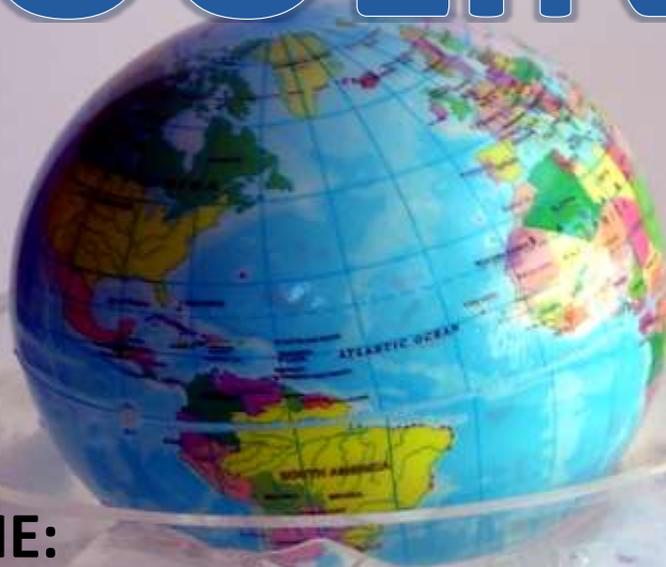


SCIENTIFIC/INVESTMENT

THE ^ CASE FOR:

GLOBAL COOLING



FACEING THE:

MILLENNIAL 2000 AD,

EXISTENTIAL ~~THREAT~~

OPPORTUNITY

THE FUTURE: IT CHANGES EVERYTHING

PREFACE:

According to the JPL project manager, upon the successful landing of the Mars Rover vehicle: “THERE IS INTELLIGENT LIFE ON MARS, AND WE PUT IT THERE.” According to the world’s most respected database, Wikipedia: Lake Toba in Sumatra, Indonesia is the result of a volcanic eruption approximately 75,000 years ago that was the largest known explosive volcanic eruption anywhere on earth in the last 25 MILLION YEARS. It had global consequences, killing most humans then alive and creating a population bottleneck in Central Eastern Africa and India that affected the genetic inheritance of all humans today.. It has been accepted that the eruption of Toba led to a volcanic winter with a worldwide decline in temperatures between 3 to 5 °C (5 to 9 °F), and up to 15 °C (27.0 °F) in higher latitudes. (Genetic researchers recently suggested that ALL of today’s “humans” are descendants of less than a dozen females surviving that near extinction event. This gene pool survived the last ice age by muscle-powered migration, without measurable contributions of energy technology).

According to United Nations population studies: We currently have 7 billion people on this planet with a probable expected population growth to between 9 and 14 billion, (apparently all with the hope for a lifestyle suggested by Los Angeles, New York, Tokyo, Mexico City, etc.). This phenomenal growth, from a world population of only one billion at the beginning of the 19th century, was made possible by the adoption of energy technologies (wood, coal, oil, electricity) based on the extraction, ownership and sale of the BTU’s of heat that those fuels represent. (But most scientists are aware that entire populations have gone nearly extinct as they consumed their limited supply of: (food, wood, and now soon perhaps: coal, oil and natural gas expected during the current millennium) stored energy (aka BTUs).

According to geographers and demographers, the last millennium (1,000 to 2,000 AD) has demonstrated the unstoppable need to travel (migration/commerce) across the northern hemisphere’s massive land/ocean space which is simply too cold for human survival (Arctic Ocean, Canadian/ Russian-Siberian/ Mongolian/ Greenland/ Alaskan tundra) without some form of energy storage. It is a really cold world out there already.

According to the U.S. Department of Energy’s plans to develop new sources of energy, we have yet to invent or develop the ideal methods of energy generation, storage, and application which will permit the support of a world population of 14 billion and human survival into the third millennium. Their trillions of dollars spent, since the discovery of nuclear energy almost a century ago, on: fusion, batteries, windmills, solar collectors, super-conductivity, and various bio-fuels, including oil from algae, have NOT yet created an economically viable alternative to fossil fuels as the medium of energy storage. So, where do we spend investment dollars?

According to the futurist and research director of Gigmedia Consulting: The long-awaited arrival of a hydrogen “economy” is now possible for millennium 2000... provided hydrogen is NOT seen as a “fuel” to be sold, but as an energy “carrier” in a CLOSED/INTEGRATED CRYOGENIC system wherein the energy end user is also the stored-energy generator based on using “free” environmental energy inputs from wind, solar, and geothermal/geo-mechanical (wave/gravitational-water). We are not to be about being “GREEN” in order to prevent extinction, but to STORE hydrogen atoms properly, to give a better living environment experienced by those gigabodies yet to come.

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ECONOMICS:

The cost of anything ultimately can be measured in the essential input units of: MATERIALS, LABOR, ENERGY, INFORMATION/METHODS, and CAPITAL. We have developed a system/method of energy storage that is a breakthrough in total costs, all made possible exclusively by the necessary and practical exploitation of CRYOGENICS. We intend to cool the globally warmed earth, “cryogenically.”

- **MATERIALS:** Unlike all previous approaches to hydrogen energy storage, we have invented a container that is the lightest cryogenic storage structure ever developed, based on an integrated design using the lightest know materials. Less mass = cheaper handling costs for the technology’s total life cycle.
- **LABOR:** Based on innovative materials now available, it is finally possible to manufacture energy carrier storage structures in a continuous fabrication process similar to that of making sheet metal and glass by using technologies adapted from those which are currently used in making electrical cable. Ultimately, at full capacity production, expected early this millennia, such industrial process techniques are continuous and totally automated, massively making a standard unit of multi-use storage structures.
- **ENERGY:** Carriers, like hydrogen, are best stored at low temperatures (cryogenic), moderate pressures (dozens of “bars”) and on materials that very easily adsorb and release what is normally an ultra-light, and highly volatile gas. To generate hydrogen (from water), cool it, and compress it, H₂ has required total energy input levels that have long been considered too excessive to be economically viable. By engineering the system’s capital structures, (to store the H₂ carrier), tightly into the highly integrated equipment to also generate and use the energy, we have identified that the life-time depreciation and operating costs will become “nominal” provided the ultimate input process energy originates from “free,” world-wide universal sources like wind and sun.
- **METHODS:** Thanks to the now universal availability of massive computing power at near zero weight, size and power consumptions, it is now possible to totally automate the methods of hydrogen generation, storage and use to the point of soon making the formerly “industrial-age” functions of production a “back-yard” operation anywhere in the world with little or no “management” inputs. OUR game-changing, discovered breakthrough is based on the simple idea to generate and use liquid nitrogen as the key refrigerant, at volume levels unimaginable in the last century. World-wide tonnage of liquid nitrogen in this millennium 2,000 will approach that currently associated with natural gas and petroleum. This is made possible by using “free” environmental energy inputs via variations of pulse-tube refrigeration systems, cooling air down to its main components (nitrogen being 78% , by volume, of air). Hence, the key method is to “consumerize” LN₂ worldwide from available/renewable/free “assets”).
- **CAPITAL:** Availability of retained wealth, generated by previous profitable human behavior, or available long-term credit, does not exist, worldwide, sufficient to build-out a replacement of existing energy storage (fuels). RATHER, given the now emerging ability to manage political/motivational behavior via the new forms of organization based on worldwide “social networking”, the old concept of “sweat-equity” can now fund billions of small units of production that are the next step in “franchised” manufacturing. By using the key input materials of universally available sun, wind, nitrogen and oxygen, we have identified a new “corporate culture” that is suggested by “face-books” & “Goggles.”

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MARKETS:

- “FARMERS” MARKET... THE HIGHEST PRIORITY. The “green” energy initiative of the last 5 decades, has failed to integrate the highly variable and random sources of sun and wind into a high technology economy that was engineered around coal, oil and gas distributed to end users by ships, trains, trucks, pipes, and cables. These two major approaches to selling “energy” have been at opposing ends, from both the point of view of corporate competition and geographical distribution of both supplies and demands. NO electric battery technology can ever replace the energy levels needed for all transportation forms and residential/commercial: heating/cooling. CHEAP, TEMPORARY STORAGE of the energy from wind and sun is the ONLY salvation available for the economic and “process” impracticalities of wind “farms” and solar “farms,” and those of other nominally free “renewable” sources. Our storage technology approach permits building massive arrays of generation-site storage elements, and with slight variation, as the EFFICIENT “distribution” pipe from most generation-points to points-of-use. NONE of this would be practical, this millennium, without the massive generation and use of liquid nitrogen that our approach employs. Such already existing and/or proposed “farms” are the ideal customers of our approach, and represent the largest market revenue potential over time. If adopted, worldwide, cryogenic “cooling” of the globe’s energy needs will be universal.
- “DIGITAL” MARKETS...THE PROFITABLE DEMAND that’s the easiest to crack. Based on hundreds of reasons that the world’s Internet-based systems of communications can be shut down, STAND-BY energy sources to keep all existing forms of “networks” (military/corporate/consumer) running based on hard drives and chips is now an absolute necessity. 99.99% of the time, the existing plant and supplies are sufficient. But for that random 0.01% event, massive energy is needed immediately and for reasonable periods of time (even nuclear power plants need absolute reliability of on-line, instant start-up stand-by power). Promising, on-site, DC fuel-cell generation techniques are now nearing practicality. OUR integrated storage strategy is based on slow and local generation of the “energy carrier” over long periods of time, but it has the radical breakthrough of permitting massive release from storage quickly. This is based on the unique approach to storage structures engineered from the titanic demands and down to the atomic scales.
- BACK-YARD DO-IT-YOURSELF storage. The starting point of this industry (our first business) acknowledges that the REAL, first market is for the construction of structures and equipment, by upper-middle class “home owners” who already have the potential to yard-install a windmill/solar-collector and fuel cell generation capability in order to avoid the failures of the power grid and/or a millennial economic breakdown. In the past 20th century, millions have built and invested in their own vacation homes, private planes, sports-cars, boats, vegetable gardens, sports/hobby interests/businesses, all based on a motivation of self-sufficiency and individual survival. OUR storage technology is NOT NOW, nor ever likely to be, appropriate for high-rise city dwellers of New York City. Rather, the first “home” storage of several gigajoules of energy (H₂) for occasional use, or emergencies, be they to deal with natural disasters or recreational enjoyment of life “off the grid,” is now possible with our technology and is the first target for entrepreneurial development.

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ORGANIZATION:

- **SOCIAL NETWORKING, GOING CRYOGENIC:** Not too long ago, most folks maintained, repaired and modified their life's third largest investment (beyond the home mortgage and higher education) which was their personal transportation vehicle (from the bicycles, then hot-rod/drag-racers, and even now to a made-at-home private (experimental) airplane). With the universal adoption of Internet based Googlized communications, we now have millions of small, narrowly focused special interest groups, in nearly constant communication, that can now go "international". Culturally, gone are the days of lifetime employment, job security, employee stock-ownership and loyal: management, or employees. The poster child of this millennium 2,000 cultural reformation is the worldwide acceptance of Google, Wikipedia and "face-book" type massive sharing of information and behaviors, and even funding.
- Cryogenics (cryonics) has been the highly productive "secret" art of DOD/ DOE/ NASA/ CIA/ CORPORATE RESEARCH and a few high-school science teachers. Using internet/website data sharing and publication; the design, construction and operation of entire energy systems centered on hydrogen storage is our path to the first 20 years of technology demonstration. Early adopters (customers) will be involved as essential members (included as early investors/via buyer's-deposits) in our organization, coupled with a franchised opportunity for them to learn the details of our cryogenics and a revolutionary approach to energy storage. Rather than being mere "consumers", the early adopters will share, partially, in the ownership and promotion of local activities and construction events based on this technology.
- Much as the Wikipedia is an open communication network with thousands of contributing authors and hundreds of millions sharing the edited knowledge base, the liberation of cryogenics from the trade secrets of massive corporations and unmanageable government bureaucracies is the culture (perhaps growing to cult-like status, in some cases, as happens with many entertainment, sports/hobby and Apple "user-groups") that will be our focus. More revolutionary, the successful generation of a stored energy carrier generated from wind and sun, is to be positioned as part of the positive attitude culture to embrace the new technologies of the next millennium, rather than defend old and proven ways that are now under existential assault. Much of the "hydrogen-economy" and solar/wind community had its birth in this tradition.
- **INTELLECTUAL PROPERTY PROTECTIONS:** Currently, nearly a dozen patents covering this approach are already in preparation. With the growth of currently independent researchers associated with this breakthrough, we assume that hundreds of patents will eventually cover technical alternatives and applications with the appropriate royalty compensations. Core, however, is the manufacturing method of the storage unit structure and appropriate materials which will be protected by trade secrets where-ever appropriate. To achieve this level of security, which ensures the profitability of this business approach, our technology base will be built on an approach to joint-ventures and consortiums of both suppliers and major potential end-users once the economics and production permits large scale use.

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WINDOWS OF OPPORTUNITY:

- Like a professional association with its publications and monthly/annual meetings, membership in this technology development program has several levels of commitment and investment. Sustaining members must be investing exclusively via patents assigned to them (exclusively) and in turn exclusively licensed through this association. We focus on the ownership of knowledge.
- Next come potential clients/customers who invest in early stage (in VC terms: “angel” investors) product development and its many demonstration events, much like that which has become the practice in experimental aviation and software innovations. Admittedly, making the storage of hydrogen CHEAP and ULTRALIGHT will most likely be dependent on some structural materials that have yet to be manufactured. Therefore, selected suppliers of materials for this development effort will be offered the rights of first refusal to acquire the intellectual properties/trade secrets at various staged points in history and sales volume growth, conditional on the approval of ALL initial contributors.
- Finally, NONE of this breakthrough has been possible without the knowledge base created by the world’s governmentally funded research efforts over the past 100 years. However, it is now obvious that typical federal bureaucratic agencies have had an extremely difficult time taking technology from hard science to continuing profitable enterprise. Hence, there exists the opportunity for future government agencies to join a consulting coalition of multiple agencies whose cross-cooperation can be at the core of establishing the necessary permissions to develop this technology as rapidly as possible. Specifically, generating/storing hydrogen, by the general public (end users, even in their backyards) in quantities that will someday equal the total energy equivalents of coal/natural-gas/oil, has tremendous implications, both positive and negative impacts, by way of legislation, licensing, regulations and the essential profitability to investors. Early indications from some governmental agencies, and very few political leaders, toward the efforts of ARPA-E to have cross-cooperation among agencies toward “outside the box” breakthrough developments are definitely good news. However, unlike most previous research done using government funding of university based research, we intent to work outside of that rather closed network of “professional” research. In all cases, entrepreneurialism will be the core opportunity.
- OPPORTUNITY FOR PROFIT: What is new in our Millennium-2000 is the method to profits as started and proven by Apple and Google and YouTube and Facebook. There, the core assets developed are highly protected intellectual properties, which initially are used to give away something of value to one population segment in a way that benefits several other segments. In our case, what will be seen as “free” to some is the hydrogen that can be generated and stored locally. That is, hydrogen is not to be an essential mass market distributed “fuel” for profitable sales as is the case for the history of fossil fuels. Sun and wind and nitrogen, and even rain-water, are, at their essential natures, FREE and available nearly universally. However, like in the context of religions, professional associations, higher education, political organizations, sports/entertainment events, the core behavioral activity is to create massive numbers of participating members at the lowest levels, and highly privileged, yet profitable, activities for the leadership levels. “Profits” will be therefore related to personal appearances of game-changing evangelists. How else can we ever get to Millennium 3000? Are you reading this, Larry Page?