FUSION ENERGY SOLUTIONS OF HAWAII
The DeLuze Fusion Reactors, an Executive Summary

A. Introduction

Our 5-year, $1 billion project leads to over $88 trillion of energy wealth over 20 years. The key innovation is a carbon free, pollution free, economical primary energy source for humanity: fusion. Contained, sustained fusion reactors represent tiny microscopic suns in chambers here on earth. Controlled, relatively safe, sustainable, portable hot hydrogen fusion for as long as we need it. We have incorporated to: raise funding, obtain energy system patents, do further research, bring fusion energy technology online, and address the challenges of sustainable, renewable energy.

We have invented, patented (8,090,071), have patent pending (application 13/317,838 and 13/999,689), and own the foundational intellectual property of the energy systems of the future. We are in a a position to significantly shape the future energy landscape. These innovations include the DeLuze Phase I and II reactors, and an electromagnetic radiation-to-DC electricity absorber, and other energy related technologies.

The reactors are concentric AC particle accelerators wherein fusion reactive gases are ionized and accelerated to a target where they collide at fusion reactive velocities and fuse. The absorber, upon surrounding a fusion reactor running a reaction with no neutron flux, will change all emitted radiations from the reactor to DC electricity at a voltage predetermined by the absorber's design. We have processes to operate fusion reactors without emitting dangerous neutron flux. These innovations provide for portable, mobile reactors in vehicles as small as an automobile. A gallon of water will provide the hydrogen fuel with the energy equivalent of 50,000 barrels of oil, 10,000 tons of coal, or 2,100,000 gallons of gasoline.

B. Advantages

- Establish national leadership and dominance in the world energy market.
- As the genesis of a new energy industry, will provide profound national economic and job stimulation.
- Provides sustainable, clean, unlimited, relatively safe energy as long as humanity needs it.
- Establishes national technological leadership.
- A $1 billion project leads to over $88 trillion in energy wealth over 20 years.
- Establishes technological spin-off industries that will change the world as we know it.
- Establishment of a sustainable green energy industry capable of meeting our energy needs.
- Appropriate, protected use of limited hydrocarbon resources for their valuable chemical contents.
- Reactors available over a large power range from home sized 10 kW units to gigawatt class sized units.
- Elegantly simple without the thermal barrier problems of competing technologies.

C. Phase I reactor optimization

We will start with a 2,400-watt prototype research phase I reactor, a $200 thousand project. Then the phase I reactors will be optimized for production, a project that is budgeted at $5-10 million, and 1 to 2 years duration. Our reactor and Lawrence Livermore Lab’s (LLL) reactor, US 7,139,349, are paradoxically nearly identical yet radically different. During the fusion duty cycle, the operation is exactly the same. The Livermore reactor is time domain "static", with one operational mode: accelerating ions inward to a target with a limited time, non-sustainable duration. Our reactors are time-domain “dynamic", cycling through an AC “driven" sequence, providing sustainable, repetitive power impulses producing continuous power. Dynamic, cyclic operation provides such an operational magnitude difference that issuance of separately delineated and patented intellectual property was the result. Dr.

DeLuze obtained the patent on concentric AC acceleration and holds the intellectual property priority on linear and concentric AC acceleration.

LLL has already proved the validity and efficiency of impact velocity driven fusion with their operational, concentric DC particle accelerator. The only difference between these similar reactors is in their time domain behavior. Advancement from static DC to dynamic AC operation is just a matter of materials and process engineering. Experimental operation with the research reactor will demonstrate the dynamic cyclic operation of sustainable, repetitive power impulses that can operate continuously, providing power production.

D. Demonstration Megawatt Power Plant

Successful phase I prototype operation opens multiple pathways of research and opportunity. Next, we plan a commercial demonstration plant in the megawatt class of power output, development of boost reactors, and simultaneous marketing of future energy options to the electric power industry. This will be a $75 million project with about a 3-5 year time budget. With successful demonstration; worldwide marketing, engineering, and construction of power plants can begin.

The path to fusion electric power generation is two fold. Construction of newly designed power plants specifically designed for efficient, economical operation on fusion. Modification of current hydrocarbon burning power plants with boost reactors. Current combustion steam plants use about 1200 degree Fahrenheit (dF) steam for thermal energy efficiency. Steam at only 350-500 dF is thermally efficient and inexpensive with fusion, but not with hydrocarbon burning. Inexpensive, simple fusion boost reactors for preheating steam to 450-500 dF could be adapted to almost all existing combustion electric generation systems in 5 years. This preheated 500 df steam could then be heated to the required 1200 dF steam by hydrocarbon combustion. This would reduce CO2 output and hydrocarbon dependence of existing electric plants up to 40%.

E. Phase II Reactors

Phase II reactors are the phase I variants inverted, with the central target being virtual. The concentrically accelerated, radially and axially centered ion beams collide at a central point. Head on collisions of oppositely approaching ions provide collision velocities greater than given individual ion's velocities, thus producing ion collision velocities sufficient to fuse light hydrogen, along with all heavy hydrogen isotopes. This provides for operation on hydrogen from water without prior expensive concentration of water to heavy water. Research and testing with and without catalyst gases will ensue. This is budgeted at approximately $80 million, and 2-4 years duration.

F. Radiation To DC Electric Absorber

The electromagnetic radiation to DC electricity absorber, upon surrounding a fusion reactor running a reaction with no neutron flux, will change all emitted radiations; including Gamma, X-ray, UV, and IR, from the reactor to DC electricity at a voltage predetermined by the absorber's design. This provides for portable, mobile reactors in vehicles as small as an automobile. This includes remote station power facilities, power for ships, trucks, trains, and aerospace vehicles. This is our most advanced, cutting-edge technology and is technically the most difficult to achieve. It has profound implications for the future of energy use. For a basic demonstration of proof-of-concept, this project is budgeted at $200 million, and 5 years duration. At the same time a demonstration fusion car using simpler, but much heavier and bulky technology, will be constructed with the goal of driving it round trip from Los Angeles to New York. The car would use less hydrogen than extracted from a gallon of water. This project is budgeted at $25 million, and 3-5 years duration.

G. Ancillary Projects

Other projects including development and processing of non-neutrogenic fusion fuels, transmutation of radioactive elements into nonradioactive elements, mass separation of gases, mass spectrometry, oil and hydrocarbon fingerprinting, highly sensitive contraband detection, automated blood analysis, and other spin-off research projects is budgeted at approximately $100 million over 5 years duration.

H. Desalinization Plant

A demonstration desalinization plant project is budgeted at $25 million and 3-5 years duration.

I. Market

1. Electric Generation Industry.
Our first customer will be the electric generation industry. US electric power production is at about 38 Quads yearly, about 25% of the world market. Based on 10% royalty the opportunity is about $62 billion yearly in the US, and $246 billion yearly worldwide within about 10 years of operation of the prototype.

2. Potable Water Industry.
Our second customer would be the fresh water industry. Nearly a billion people worldwide do not have access to fresh water. Half of the world's population suffers disease due to lack of sufficient fresh water. The US's fresh water reserves are tapped to about their limit. California is currently facing a drought crisis. Fusion driven desalinization plants that we have designed can provide adequate fresh water in quantities needed with economically designed, constructed, and operated plants.

3. Transportation Industry.
Our third customer will be the transportation industry: aquatic, land, air, and space. We have fusion driven engine technologies for all of these areas. A Boeing 747 equivalent going 250,000 miles on the hydrogen from a gallon of water. A ship going around the world on the hydrogen from a gallon of water. A space shuttle craft launched into orbit on the hydrogen from a gallon of water. Spacecraft going to the moon and planets in hours to days, rather than weeks to years. Fusion engines permit constant 1-2 g acceleration/deceleration resulting in vastly reduced travel times, compared with fuel limited chemical propulsion engines. Unmanned craft can sustain higher g levels resulting in even shorter travel times.

4. Automotive Industry.
Our fourth customer would be the automobile industry. We have technology to make it possible to put these reactors in cars, trucks, and busses. A car going 35,000,000 miles or a city bus going 8,000,000 miles on the hydrogen from a gallon of water.

5. Petrochemical Industry.
Our fifth customer would be the petrochemical industry. Our power source is a primary energy source, the actual source of the energy. Hydrocarbon products constitute secondary energy, the Sun being the primary source. Burning (oxidation) releases this stored energy. The wastes (CO_2 and H_2O) are molecules at low Gibbs free energy and accumulate in the atmosphere and oceans. Plants use solar (primary) energy to recycle some of these low energy molecules back to high-energy storage molecules (hydrocarbons and oxygen).

With a primary energy source, petrochemical companies can take the accumulating low energy molecules and recycle them back into the high-energy molecules. They can then sell these compounds. The issue here is the lack of a primary energy source here on Earth. With a primary energy source operational on Earth, oil/petrochemical companies then become major players as part of an ultimate green industry. They will then be able to recycle "burnt hydrocarbons" (CO_2 and H_2O) back into fuels and other valuable petrochemicals. This requires an operational primary energy source on Earth. We are presently just

consuming stored sunshine of the past. Oil/petrochemical companies have the infrastructure in place to distribute these synthetically recycled, (and by design) cleaner burning fuels back to consumers.

We stop at five, but there are others such as remediation of solid, liquid, gaseous, and radioactive wastes. The opportunity is the future energy market. All present energy used by humanity is secondary and limited, and originated with solar fusion.

J. Benefits

These processes provide carbon free, relatively safe, environmentally friendly energy systems using hot hydrogen fusion reactors, a source of unlimited primary energy for as long as we will need it. Processes utilizing this primary energy will be able to reduce and provide remedies for the harmful effects of hazardous wastes and materials in the environment.

In 2010 the world energy consumption was about 500 quads. This is about 86 billion barrels of oil worth $6.9 trillion based on oil at $80 per barrel. With fusion, the hydrogen fuel would come from only 1.8 million gallons of water, the amount of water in just 600 medium-sized swimming pools! That's sufficient for the entire world's energy use in the year 2010.

All of this energy is carbon dioxide free and relatively safe. The opportunity of over 100 trillion dollars of energy wealth creation over 20 years, all from water, plus energy independence, waste recycling, and elimination.

Without a primary energy source on earth, we oxidize hydrocarbons for energy. This releases the stored solar energy previously captured by plants. Plant life cannot recycle spent molecules as fast as we presently use them. Net accumulations of these form most greenhouse gases, a global concern. Reversal of this situation requires a primary energy source, as provided by fusion power.

K. Budget

This project would start with an initial $200 thousand prototype project, followed by an initial $10 million for the first year. Initially, office, lab, shop, and testing space would be leased in Hawaii. Machining and assembly of the prototype is to be done on a contract basis with scientific machine shops available locally. Further assembly and testing is to be done in leased facilities in Hawaii.

Prosecution of an estimated 100 worldwide patents is estimated at $300 million over 5 years duration. Appropriate lab, office, shop, and testing facilities will be purchased and constructed, with a budget that is estimated at $160 million. General operational costs for the corporation is estimated at $25 million over 5 years duration. This brings a total budget of $1 billion over 5 years. It's important to note that about one third of this budget is for patent applications. This intellectual property secured will have value into the trillions of dollars and provide the solution to humanity's future energy needs, a priceless value. Based on the $1 billion budget, the stock valuation is $250.00 per share, representing 40% of the capital stock of Fusion Energy Solutions of Hawaii, Inc.

BUDGET ITEM	COST/ $ MILLION	TIME/ YEARS
Phase I reactor optimization	5-10	1-2
Lab, office, shop, testing facility	160	2-4
General corporate operation	25	5
100 worldwide patents	300	5
Demonstration Power Plant	75	3-5
Phase II reactors	80	2-4
DC absorber	200	4-5
Ancillary projects	100	5
Demonstration Desalinization Plant	25	3-5
Demonstration Fusion Car	25	3-5
TOTAL	1000	5