

# **Economic Reconstruction**

By William Gray

## Abstract

The US faces four threats:

- 1) Multi-front War
- 2) Economic
- 3) Energy Dependence
- 4) Environmental Degeneration

Differentiate them into a common denominator, resolve it, and the threats resolve themselves.

## **I) Multi-front War**

No nation has ever successfully engaged in an escalating multi-front war. It started with a concerted 9/11 attack, drew us into open conflict in Iraq, expanded into Afghanistan, politically confronts us in Iran, and threatens our positions in Pakistan, Serbia, and India.

It appears to be a radical religious movement that inspires peasants with spiritual fanaticism, arms and trains them, and drives them with a fear of us. It is a guerilla conflict that expands fronts faster than we can contain them, while they only face one front – us.

It is very difficult for an organized military to succeed in a guerilla war. Its flanks and supply lines are always exposed, one guerilla can bring down a chopper, guerillas and civilians cannot be distinguished, and most importantly, their very low direct expenses are leveraged into enormous costs to us in terms of security, resources, and maintaining and mobilizing a standing multi-front military presence. We collapsed the Russian economy with Afghanistan guerillas in the 1980's.

A guerilla threat is headless, without infrastructure, and so to defeat it one does not identify and capture its leaders, attack its ideology, or even confront it directly. Instead, simply neutralize the factors that make it strategically significant and economically isolate it. It arose out of the Middle East, the strategic significant is oil, and we depend upon it.

Solution: eliminate our dependence, remove our presence, and let their own internal forces restore stability. We simply need an oil replacement, and for our dollars to stop funding their radical activism.

## **II) Economic Crisis**

After a decade of “Stagflation,” the Dow Jones underwent a dramatic 1400% rise between 1982 and 1999. Real estate enjoyed similar appreciation, continuing until 2007, while the Dow only rose 25% to 14,000+ (excluding the 3000 point drop and recovery from 9/11). Suddenly both sectors underwent more than a 40% deflation in 2008.

In an attempt to stop the free fall, the federal government instituted a series of interest rate cuts, down to 0 - 0.25%, and made \$3.69 trillion in credit available (Temporary Liquidity Guarantee Program – \$350 billion; Troubled Asset Relief Program – \$700 billion; Commercial Paper Funding Facility – \$1.3 trillion; Money Market Investor Funding Facility – \$540 billion; Term Asset-backed Securities Loan Facility – \$200 billion; and Government Sponsored Entities Purchase Program – \$600 billion).

Of course these actions had an effect, creating a DJ buoyancy level of around 6500 and preventing a full contraction back to the 800 level of 1982. In conjunction with these Wall Street actions was the announcement of a 2.5 million job public works program by President-elect Obama, aimed at restoring Main Street confidence. To be sure, these measures forestalled a total collapse, but they should not have been necessary and in reality they only provide a temporary solution.

Over the past century this country has experienced four economic periods:

- 1) Federalism and Ponzi-ism
- 2) Public Works and low-end value-added economics
- 3) Oil Dependence and high-end value-added economics
- 4) Deregulation and Derivative-based Equity Creation

The first, marked by creation of the Sherman Act, Clayton Act, Federal Trade Commission, Federal Reserve banking, and Ponzi “pyramid” schemes, ended in Depression. The second involved public works programs to stabilize the collapse and a rise of industry predicated on the concept of adding value to raw materials to create tangible value. Iron ore was mined, refined, and transformed into cars, ships, and buildings to create wealth.

The third period was marked by creation of tangible wealth by addition of high-end technology such as semiconductors, computers, software, and data communications, etc., and by the opposing economic force of oil dependence, resulting in Stagflation. Finally, the fourth was marked by rapid economic growth and collapse, driven by labor outsourcing; arbitrage; corporate, pension fund, and Savings & Loan asset raids; and creative accounting practices that fraudulently repackaged economic risk into high yield assets.

Pragmatically, a total collapse was avoided by instantaneous creation of trillions of dollars of credit (and future tax obligations), reducing the cost of money to near 0%, and, creation of public works. However, at present there are no economic forces in place to grow the economy. In the past, deregulation and labor outsourcing increased profitability that leveraged into large stock equity increases. But the recently created credit is only amortizing defaulted loans and “credit guarantee swaps” into long term losses.

When a bank makes an 80% loan, it is credit because the property is under-assessed by 20% and the purchaser has a vested interest in it. However, in the tradition of Charles Ponzi, hostile takeovers of pension funds, Keating junk bond repackaging, and Enron-ic creative accounting, someone figured out how to transform debts into assets on paper.

Subprime loans replaced 20% down payments, and a new wave of unqualified buyers was created to increase loan demand and appreciate property values. A second wave of buyers was created when the Fed, and then the financial institutions, dropped interest rates and loan

payments. Finally, a third wave of buyers was created by “balloon” loans that deferred subprime payments until appreciation from all the newly created buyers would make refinancing possible.

This was an inverted Ponzi scheme, debt pyramids that create equity appreciation by demand for property created by the unregulated loans. It had to end, either when interest rates rose or the supply of unqualified buyers was depleted. The supply side of the credit was just as fraudulently created. These highly risky loans were repackaged as high yield mortgage backed securities with un-capitalized “credit guarantee swaps” to make them appear more secure, junk bonds with a new face.

Real Estate was overdriven by creation of unsecured debt, and it’s unlikely that normal market appreciation will compensate for the losses for at least a decade, but this wasn’t the only creative fabrication of wealth. The pharmaceutical industry lobbied for a law prohibiting US citizens from purchasing less expensive medications from other countries, creating a profitable US monopoly for themselves. Credit Card companies lobbied for bankruptcy reform that denied relief for voluntarily acquired debt, then issued 2% credit cards that jumped to 24% on a late payment, creating high yield account receivable assets.

Agribusiness optimized profits by hedging against price fluctuations with futures contracts, and then spun them into profit generators because they were so large they could control prices. Corrections became a growth industry by organizing crime victims’ groups and lobbying for longer prison sentences and restricted appeals processes, resulting in over 25% of the world’s 8 million prisoners. The Electrical Energy sector got statewide energy shortages by increasing generating plant scheduled maintenance shutdowns.

Every sector participated in fabrication of wealth by predatory practices. The economy ballooned up, and then contracted radically when the forces creating the profits dried up, and it cannot be repeated. Labor has already been outsourced, credit has already been overextended, risky loans have already been repackaged, electrical energy has already been deregulated, agribusiness has already optimized profits with futures contracts, etc., and people are now additionally burdened by massive asset and retirement plan losses, rising unemployment, and increased tax obligations.

The Electrical Energy sector is particularly interesting. Several years ago a severe electrical energy shortage occurred. In California 25% of the generating plants were down for scheduled maintenance, compared to 5% normally. Southern California Edison transferred its \$3 billion in cash reserves to its parent company Edison International, a conglomerate that controls hundreds of obsolete and inefficient oil-fired generating plants across the country.

Suddenly, in the midst of a hot summer, the utilities threatened bankruptcy if they were not deregulated and California found itself purchasing electricity from Edison International and power brokers like Enron at peak “spot” rates of three to five times non-peak contract rates. California Governor Gray Davis signed a seven year contract for this higher rate power, the utilities were deregulated, consumers’ rates tripled, and as suddenly as the power shortages appeared, they vanished.

The sophistication of these schemes is alarming, especially where government is involved. The FCC deregulated the airwaves so operators could acquire large multimedia monopolies. It then auctioned off the channels for billions of dollars. The companies merely passed the expense on

to the public in the form of increased commercials and infomercials, and the public was forced to subscribe to their cable networks to get the same quality they enjoyed prior to deregulation. Government profited, the companies increased earnings, and the public paid in added cost and decreased quality.

It is wrong from a moral, ethical, and fiduciary standpoint; and legally, under Antitrust, and its derivative RICO, presumption of innocence may be overcome by a pattern of acts and completed results. The pattern of criminal conduct requires only that they be “chargeable” or “indictable” offenses, “the word ‘conviction’ does not appear in ... the statute.” Sedima SPRL v Imprex Co. (1985) 473 US 479, 488. Mens rea is only required for the predicate acts. Brunner Corp. v RA Crunner Co. (7<sup>th</sup> Cir 1998) 133 F3d 491, 494 n.3.

Pattern is established by “chargeable” and “criminal acts that have the same or similar purpose, results, participants, victims, or methods of commission, or otherwise are interrelated by distinguishing characteristics.” Sedima @ 496 n.14. “Specific intent ... is necessary only when the acts fall short of the results condemned ....” US v Griffith (1948) 334 US 100, 105. The law “directs itself against the dangerous probability as well as against the completed result.” Id @ 106, quoting Swift & Co. v US, 196 US 375, 396. “[N]o monopolist monopolizes unconscious of what he is doing.” Griffith @ 105, quoting US v Alcoa, 148 F2d 432.

Under the Noerr-Pennington doctrine, “a concerted effort to influence public officials regardless of intent” enjoys First Amendment immunity, United Mine Workers ... v Pennington (1965) 381 US 657, 670, and “government retains the power to act in a representative capacity ... and ... people [can] freely inform it of their wishes ....” Eastern RR Pres. Conf. v Noerr Mother Freight (1961) 365 US 127, 137-8. It does not however provide immunity for bribery, fraud, or deceit (Armstrong Surgical Ctr., Inc. v Armstrong County Mem’l Hosp. (3d Cir 1999) 185 F3d 154, 162) or “a mere sham to cover what is actually nothing more than an attempt to interfere directly with the business relationships of a competitor ....” Noerr @ 144. “The character of every act depends on the circumstances in which it was done .... The most stringent protection of free speech would not protect a man [or special interest] in falsely shouting fire in a theatre [or defrauding the public] and causing a panic.” Schenck v US (1919) 249 US 47.

If government fails to address these issues, then it condones them, but more importantly it fails in a constitutional obligation “to regulate commerce” and endorses creation of counterfeit equity. The public no longer trusts government because they see their assets, retirement, and jobs vanish because of deregulation and fraudulent equity creation. There is no substance to an economic system that coins money by creative and fraudulent accounting practices. If the equity was real then how did real estate and the market lose 40% of their values in a year?

The purpose of this document is not to point fingers, it is the responsibility of the DOJ to extricate corruption from government and business. The purpose of this document is to reconstruct the economy by reintroducing the forces that create real wealth. The current system fabricates value on paper, real wealth comes from adding value with new and better technology or by adding labor and energy to raw materials.

It is not technology’s fault that high oil prices offset its gains and caused Stagflation, it is energy dependence that jeopardizes our economy. Ronald Reagan ended Stagflation and transformed Voodoo Economics into Reaganomics with a very simple strategy, outsourcing to cut labor costs from \$20/hr to \$2/day. Profits and stock equities rose exponentially. In hindsight it was a death

toll for our economy, however, because it established a policy of sacrificing American workers for corporate profits.

Instead, if we had been able to reduce energy costs 100 to 1 it would have offset higher US labor rates and the economy would have enjoyed steady value-added growth from new technology and labor. Again, the common denominator is energy independence. Extricating ourselves from Middle Eastern oil removes our presence by eliminating its strategic importance, neutralizes the guerilla's financial engine, and revitalizes our entire Manufacturing, Materials Manufacturing, and Electrical Energy sectors (80% of the cost of electricity, steel, metals, concrete, glass, semiconductors and chemicals could be eliminated by energy independence and a 100 to 1 energy cost reduction). This would create genuine value-added economic growth.

### **III) Energy Independence**

#### **A) True Energy Independence**

This does not just mean independence from foreign oil, it also means independence from conventional costs and carbon loading of the environment. It may sound unfeasible, but so was the A-bomb before the Manhattan Project and going to the moon before Kennedy.

In each case the goals drove development of the technologies needed to achieve the results. Today everyone has a car that needs gas so we focus on fossil fuels, and associated evolutionary and alternative energies. The Manhattan Project and Space Program were revolutionary development, designed to accomplish what was previously unfeasible, like the steam engine, electric lights, and mass production. Need created new technology.

People have been talking energy independence since OPEC caused "Odd-Even" days at gas pumps in 1972. Thirty six years later it is still a pipe dream. Global warming and increased oil prices over the years have revitalized efforts, but high costs, lack of new technology, and inconsistent interest have limited development. If nothing else, this economic crisis will create a sustained and pressing need for such new technology.

#### **B) Alternative Energies**

Wind, solar, tidal, geothermal, and hydroelectric energies are good ideas that make use of currently available energy sources. Alternative fuels like hydrogen, ethanol, methane digesters, bio-diesel and coal gasification are good co-generation ideas that make use of waste products and "dirty" fuel sources. However none have proved viable from either a cost standpoint or ability to meet the demands of an industrialized nation that consumes 20% of the global energy.

Their technologies add a minimum 20% premium over conventional energy sources when amortized over 20 years. Many are also intermittent and their conversion efficiencies are low compared to 40% efficient coal fired boiler – turbine generating systems. The best solar cells don't even approach 20% efficiency and their output diminishes to 10-20% of their summer average in winter. Wind power is intermittent and needs 10 mph winds. Coal gasification needs hydrogen and heat. Hydrogen is stripped from fossil fuels, throwing away the carbon, the reverse of coal gasification. Each has its own set of problems in terms of cost, technology, and efficiency.

### C) Nuclear Fission

Nuclear energy is different. Instead of using the chemical energy in the bonds between atoms, it releases the nuclear energy in the bonds between particles in the nuclei of atoms. Pound for pound a nuclear bond releases over a million times more energy than a chemical bond, which is why a nuclear weapon with a 100 kg of uranium or plutonium yields the equivalent of a Megaton, 1,000,000 tons, of TNT. Nuclear energy at least has the potential for achieving the 100 to 1 yield increase and cost reduction needed to solve the Economic Crisis, but it has its own set of problems.

It is very dangerous, requiring sophisticated safety protocols with multiple redundancy levels to avoid incidents such as Chernobyl and Three Mile Island. It also produces lethal waste products that require isolation containment for 1000's of years. It utilizes a process that naturally wants to explode, by trying to control a chain reaction, not unlike trying to slowly extract energy from TNT or Cyclonite. It is unnatural. Conventional boiler driven generators stop if their fuel is removed. Nuclear reactors contain all the fuel they need to go critical, while they precariously try to balance the reaction between not reacting and going into run-away.

This is like establishing a practice of building conventional boiler systems on top of their fuel dumps and never expecting a problem. Amazingly, in 50 years there have only been a few disasters, but this has led to extensive research into alternative forms of nuclear energy, such as fusion of deuterium and tritium into helium. This reaction is relatively clean, with minimum waste products, but is difficult to sustain and requires more energy to make it occur than it releases.

### C) Deuterium Fusion

Deuterium fusion was selected as most likely achievable because it works in Hydrogen Bombs. However, 50 years of laboratory efforts have proven unfruitful. This is because deuterium has a proton and neutron in its nucleus, so fusing two yields a two proton and two neutron helium nucleus. But protons repel because of their positive electric charge, so it requires a tremendous energy to push two deuterium nuclei close enough together to form a nuclear bond.

When they developed the H-bomb, they actually succeeded by mistake, thinking that if they could accelerate deuterium nuclei to near-light speed, enough would statistically collide and fuse, releasing nuclear energy, to thermally energize more deuterium nuclei to near light speed, and so forth – a thermal chain reaction, hence the name Thermonuclear Reaction. Deuterium nuclei have about 2.2 MeV (Million electron Volts) of energy in the bond between the proton and neutron, and it takes about 3.6 MeV to push two deuterium nuclei together, or  $2(2.2 \text{ MeV}) + 3.6 \text{ MeV} = 8 \text{ MeV}$  to form helium, which releases 28 MeV, so there is a net energy gain, and the reaction should proceed spontaneously.

The reaction was achieved by confining deuterium (and tritium to provide extra neutrons) between two A-bombs (fissile uranium), or in the center of one. On detonation the fission reaction accelerates the deuterium nuclei toward each other with enough force to overcome the charge repulsion between the protons, and "Voila!" However, 50 years of laboratory efforts have failed, always requiring more energy to ignite and sustain the reaction than is released.

The misperception was that the reaction is Thermonuclear. A-bombs accelerate the nuclei toward each other fast enough to overcome the proton charge repulsions and contain them long enough to sustain fusion. But the reason it works is that Einstein's contraction of space, caused by acceleration of the nuclei to near-light speed, allows the electric repulsion to be overcome by the nuclear bond. Einstein showed that when objects move at near-light speed, they contract space, so two particles moving toward each other shrink the distance between them.

However, a unique novelty of Relativity is that the space contracts for independent observers, but for observers on the particles, everything seems normal and un-contracted. This is why it is called Relativity, the observed result depends on where one stands, so someone looking at the particles sees them closer together than an observer actually on a particle. This is a real phenomenon, like a passenger on a train not feeling the effect of its velocity, even though an independent observer can see them moving, and it changes the result of the physics each observer experiences.

Because electric charge originates within particles, and the particles experience un-contracted space, the charge repulsion force is much weaker than an independent observer's contracted space says it should be. The nuclear force, however, doesn't originate from within particles, it forms when they are at a specific distance from each other (0.4 fermi,  $0.4 \times 10^{-15}$  m), as seen by an independent observer. When an A-bomb detonates, the energy released contracts the space at its center and accelerates the deuterium nuclei towards each other, further contracting the space between them. This allows the nuclear bonds to form while the electric force, seeing the greater distance of un-contracted space, is too weak to oppose it.

Needless to say, attempting to duplicate a micro-scale atomic explosion in a laboratory setting is difficult so the electric repulsion force remains a significant obstacle to the formation of the nuclear bond. Absent the explosion to accelerate the nuclei and contract space, Deuterium fusion will always consume more energy than it releases, making it unfeasible as an energy source.

#### E) Neutron Fusion

Stars don't fuse deuterium; they transform hydrogen into neutrons and fuse them into helium all by themselves with no help from man. Physicists first rejected this fusion approach because they believed the reaction was Thermonuclear, from high speed collisions between the particles as caused by the stars' high temperatures. They figured that since deuterium nuclei already have a proton and neutron, they are half-way to the two proton and two neutron helium nucleus.

This assumption wasted 50 years and billions of dollars. The thermonuclear temperatures are the result of released fusion energy, not the reaction's cause. The actual reason neutrons fuse is that they have no electric charge to repel each other, and they have a magnetic field that draws them together, like magnets, and in fact, neutrons released in nuclear reactors do fuse into helium on their own.

When this reaction occurs it releases a lot of energy, 28 MeV, about 14 million times the typical 2 eV (electron Volt) energy in a chemical bond, which causes nearby neutrons to fly off, "quenching" the fusion process. Stars overcome this problem because their gravity is strong enough to confine the neutrons to their nuclear bonding distance. Fortunately, the bulk of the energy released is electromagnetic (light), which escapes from the stars' gravity, effectively

“cooling” them so the neutrons can interact without too much quenching from thermal energy. If stars held on to all the energy produced, their reactions would be very inefficient.

Earth’s gravity, however, is too weak to confine the neutrons and the electromagnetic energy released would heat the surroundings, thus converting back to thermal energy. The only force supporting the reaction would be the neutrons’ magnetic fields, which are only strong enough if the neutrons are already confined near their nuclear bonding distance by the stars’ extremely strong gravity. This gravity also transforms the stars’ hydrogen into neutrons. Neutrons are hydrogen atoms with orbital electrons energized 57,500 times to 0.782 MeV, and the resultant orbital space contracted by Relativity. They hydrogen “falls” through the stars’ gravity to gain this energy.

Sometimes neutrons form naturally on earth by a process called Electron Capture, when an orbital electron statistically gains enough instantaneous energy to be captured by a proton in its nucleus. In the late 1940’s and early 1950’s an Italian scientist named Borghi figured out that since neutrons decay into a proton, electron, and 0.782 MeV energy, it should be possible to excite hydrogen electrons to form neutrons, which he did with a measurable production of neutrons in 1955.

Borghi’s results were rejected by physicists, however, because he could not explain how it was possible in terms of Quantum Theory, which says hydrogen orbital electrons can only have quantum energy states of 13.6 eV or less, 57,500 times less than the neutron’s 0.782 MeV energy state. In the late 1970’s, Missfeldt from Germany performed a similar experiment and also detected neutrons. His results were not disputed, but synthesis of neutrons from hydrogen is still not generally accepted.

In 2002, a Quantum Theory based neutron model was developed which showed that at high energies the quantum behavior becomes classical because of Relativity. Based on this model a much more efficient method of synthesizing neutrons was developed, about 90% as opposed to the 0.001% - 0.01% Borghi and Missfeldt efficiencies, and a way to react them into helium was devised. (See Neutrons and Modulated Quantum Neutron Fusion at [www.mqnf.com](http://www.mqnf.com))

The same year, a patent was applied for and the Department of Energy was approached (see 06/23/02 letter to Spencer Abraham). In 2004, the DoE responded negatively (see 12/13/04 letter from Dennis Kovar), saying that neutrons cannot be synthesized from protons and electrons on earth, and that four neutrons cannot fuse into helium, which was curious because it occurs in nuclear reactors and venting the hydrogen and helium produced is a design criteria.

A year later, in July and September, 2005, papers were published by Shung-ichi Ando (Neutron-Neutron Fusion and Electroweak Processes of the Deuteron in Effective Field Theory), stating that “ultra-high intensity neutron–beam facilities [are] currently under construction ... at Oakridge” to do neutron – neutron fusion research. Fusion into deuterium, and the fusion of deuterium and neutrons into helium, are the interim steps of fusion of neutrons into helium.

At the same time, the Patent Office denied the Modulated Quantum Neutron Fusion patent application unless the mechanism to confine the reaction and extract its released electromagnetic energy was disclosed. The DoE studied the concept for more than a year, accessing the [www.mqnf.com](http://www.mqnf.com) papers hundreds of times, rejected it as not possible on earth (where it in fact occurs naturally, in nuclear reactors, and was achieved by different scientists), and then set up its



own project to do it while the Patent Office rejects the application for a high-yield high efficiency method unless the confinement and energy extraction method is fully disclosed. Curiously, government really is attempting to achieve energy independence in its own way.

A high-yield high-efficiency neutron synthesis method was a valid basis for a patent, disclosing the proprietary confinement and electromagnetic energy conversion method would merely open the process up to “patent design around.” Key to the confinement and energy extraction is a relationship between the electromagnetic and nuclear forces, allowing the nuclear bond energy to transform directly into electromagnetic, and then electrical energy, without intermediate boiler, turbine and generator thermodynamic stages.

Just as Borghi’s theory was rejected as incompatible with Quantum Theory, the electromagnetic – nuclear force relation is not currently accepted as compatible with the Standard Model’s quark concept. Quarks are theorized sub-particles, each assigned common denominator mass, nuclear force, charge and magnetic force, and spin sub-components of nuclear particles. Because they can be combined in terms of symmetry into all known nuclear particles, and have been used to correctly predict previously undiscovered particles, they are accepted as a proven concept.

Predicting particles is a valid scientific verification of quarks’ existence. However, they are only predictive, not explicative. They do not explain mass, nuclear or electromagnetic forces, or spin. They are more like accounting tools with assigned fundamental properties. No quark has ever been detected outside of a particle, although Fermi Lab scattering experiments do seem to indicate their existence within particles. Large Hadron Collisions at Brookhaven, however, showed no evidence of quarks or their nuclear force partners, gluons. Instead of the expected fixed distance quantum nuclear force, they detected variable strength electromagnetic like forces.

Since prediction is acceptable verification, general acceptance of quarks is reasonable. However, when particles annihilate they release high energy gamma ray electromagnetic waves. In the destruction of fundamental particles like protons and electrons, their internal structures disintegrate and disintegrating structures could not consistently synthesize new structures like EM waves (i.e. quarks could not disintegrate and form EM waves at the same time). Also, electrons do not contain quarks but yield gamma rays just like protons do. Conversely, gamma rays produce protons and electrons, so if EM waves produce particles, and are produced by them on disintegration, where do quarks come from? They may be internal energy states, but their validity as fundamental sub-particles is far from certain. Would the Universe have chosen two different methods for forming the proton and electron component particles of atoms? Not likely.

Virtually all nuclear particles ultimately decay into protons or electrons, which are in turn formed by or decay into gamma rays. The Fermi Lab scattering experiments can be explained as interaction with gamma rays, since light can move particles, as in solar cells or Land’s Polaroid filter experiments. From these facts an explicative EM wave theory of particles was developed which can calculate the exact size, mass, charge and magnetic field strength, and spin of protons, neutrons and electrons, and which also calculates the exact nuclear force, bond distance, magnetic field, and spin of nuclei in atoms. Nuclear force was shown to be EM force compressed by Relativity. Quarks explain none of this.

This theory is presented at [www.mqnf.com](http://www.mqnf.com), but it would be pointless to present a confinement and EM wave energy extraction concept, based on an EM wave theory of particles and nuclear force, when the majority of scientists only accept the quark concept that cannot explain mass,

charge, etc. It would also be pointless to give away the proprietary mechanism of an energy process with a potential \$2.3 trillion annual value. The most compelling evidence of its validity though is the denial of its viability by the DoE, followed by the construction of a neutron beam to do neutron fusion, and the Patent Office's attempt to secure disclosure of the confinement and energy extraction mechanism.

#### F) Energy Pump Concept

Neutron Fusion is an Energy Pump, it takes chemical energy levels to form neutrons, which then interact at nuclear energy levels. Only 0.782 MeV is needed to form the neutron state of hydrogen, or 3.13 MeV for the four neutrons needed to form helium, which releases 28.3 MeV. This results in a 9 to 1 energy gain. This concept is similar to the more familiar technology of "Heat Pumps," used to heat homes in winter and cool them in summer by pumping heat energy into or out of the house.

It is much more efficient because the energy doesn't have to be generated, instead, existing energy is simply "pumped" from one location to another. It works like a refrigerator, pumping heat energy from the freezer compartment to the cooling coils on the back of the refrigerator. The compressor pulls a vacuum on a liquid and its molecules boil off into the vacuum as a gas, carrying energy with them. Then it pumps the gas molecules into another area and compresses them back into a liquid, transferring the energy to that region.

The energy transfers because in liquid form the molecules' motions are restricted. Their ambient heat energy makes them vibrate, but they are restricted by the molecules surrounding them. When the compressor pulls a vacuum on the liquid there are no gas molecules to keep the molecules on the surface of the liquid in place, and so their thermal vibration causes them to bounce off surrounding molecules into the space of the vacuum where they can vibrate more freely. Energy flows from the liquid into the vacuum, and at the other end, the gas is compressed back into a liquid, and with it the energy.

Even on a cold winter day there is thermal energy in the vibration of air molecules outside. When the Compressor pulls a vacuum on its refrigerant, it cools to a lower temperature than the outside, making the air "hot" relative to the refrigerant, so heat energy flows into it which is then pumped into the house. Because it takes less energy to pump energy than it does to generate it by burning fossil fuel, heat pumps are very efficient, with net energy gains.

In Neutron Fusion, instead of transferring energy by forcing a phase change between gas and liquid states with a Compressor, the distance between hydrogen's proton and electron is reduced.

Normally the electron occupies an orbital with an average radius of  $0.53 \times 10^{-10}$  meters. When electromagnetic energy is added, the electron can either ionize off into space or change its relative energy state to that of a "neutron" orbital with a 0.782 MeV, and a  $2.76 \times 10^{-15}$  m radius that is further contracted by Relativity down to the observed  $1.09 \times 10^{-15}$  m radius.

It is like the compressed state of gas in a heat pump changing into a liquid and releasing its heat energy. When neutrons come into contact with each other they interact for form deuterium, tritium, helium-3 or helium-4. Because helium-4's structure provides the greatest degrees of freedom for the electrons, it is the most stable state, releasing the greatest amount of energy as it forms.

Normally gas molecules vibrate in the 3-dimensions of space, but because particles move faster, the effects of Relativity, contracting space and dilating time, result in more degrees of freedom than for normal 3-dimensional space. In addition, because each neutron's electron can move between the other protons in the helium nucleus, they have greater degrees of freedom than if confined to the region of their neutron state. These degrees of freedom are called Entropy, and greater entropy means each electron's total energy is divided between more degrees of freedom, so it is more stable than if all its energy were concentrated in 1 degree of freedom.

The neutrons' protons on the other hand have much lower entropy because they no longer move about in 3-dimensional space, like they did when they were in free neutrons. They have no velocity so there are no effects of Relativity, and they are confined in close proximity to each other, four protons forming one structure. Increasing entropy, like going into a gas, absorbs energy, and decreasing entropy, like going into a liquid, gives up energy. When four hydrogens go into neutron states they each absorb 0.782 MeV of energy, and when they go into a helium state each electron's 0.782 MeV divides between all the new degrees of freedom, making it very stable. The four protons, being compressed together into one structure, release all the energy from all their degrees of freedom, 28.3 MeV, so formation of helium from four neutrons has a  $28.3 \text{ MeV} / (4 \times 0.782 \text{ MeV}) = 9$  to 1 energy gain.

#### G) Neutron Fusion Economics

The neutron synthesis is about 90% efficient, but the confinement and energy extraction efficiency is variable because it depends upon matching the system's load to the synthesis rate. In other words, the number of neutrons needed depends upon the power consumed by the load, and when the load changes the number of neutrons generated must be adjusted up or down accordingly.

The fusion energy is converted directly into electromagnetic, and then electrical energy, without a boiler that can absorb excess energy temporarily produced when the load or demand drops and the neutron synthesis has not been adjusted downward. Without being absorbed into a load, or allowed to radiate into space as in stars, the excess energy would melt the reactor. To avoid this, a dummy load, such as electrolysis to produce hydrogen fuel, must always operate in parallel with the actual load. This will be about 10% of the actual maximum load, with a power rating that allows it to momentarily absorb 100% of the power if the load suddenly "trips" offline. This means units can only achieve a theoretical maximum of about 80% efficiency at full load, and less than 40% efficiency at 10% load.

The confinement and nuclear to electrical energy conversion stage acts to match neutron production to power demand. It also has internal fixed losses, like a transformer in an electrical power distribution grid, which can be as small as 1% at maximum capacity to as high as 10-20% of maximum at 10% of capacity. The maximum practical output for a neutron reactor is 300 MW (MegaWatts), enough to supply a 230,000 home community.

Because the reaction is nuclear, not chemical, it will produce over a million times more energy than can be achieved by burning the hydrogen, or fossil fuels. A gram of hydrogen will yield about as much energy as a ton of coal currently produces by a conventional boiler, steam turbine, genitor system, or 1¢ versus \$60-\$100 / ton. In other words, neutron fusion not only eliminates

the cost, size and construction time associated with a 300 MW boiler system, it also produces the energy with negligible fuel cost and environmental impact.

This makes the reactors semi-portable, manufacturable in a factory with mass production practices, and shippable to end-user sites such as local communities or Materials Manufacturing plants to produce steel, concrete, glass, metals, and chemicals. This approach brings the source to the point of consumption, eliminating the need and cost of energy distribution grids, and potential blackouts. The system will be designed with tandem reactors to ensure uninterrupted power, and will cost in the neighborhood of \$25 million, compared to \$400 million for conventional 300 MW boiler plants.

The system will adjust down to 25 kV loads without distribution transformers, and require a footprint of about 800 ft<sup>2</sup>. A factory could reasonably produce ten 300 MW units a day, or about 5,000 in two years. Several factories could easily relieve the US of its dependence on foreign oil within that time frame, generating hydrogen fuel by electrolysis, and petroleum products by domestic coal gasification for consumption that cannot be converted to hydrogen, in addition to satisfying all electrical energy needs. This would mean \$2 billion per day (\$700 billion annually), back into the US economy and relieve the Middle East of revenues for radical activities.

Unlike conventional fission reactors, other than trace amounts of tritium, there are no radioactive waste products, no waste products at all except for a gram of inert helium for each energy equivalent produced from a ton of coal. Other than amortization of the \$25 million unit and maintenance costs, operating costs are nearly zero, with no moving parts other than vacuum pumps to wear out, and the operation is totally computer controlled except for monitoring by safety personnel.

Compared to conventional reactors there is no danger of core meltdown, containment vessel breach, or other type of nuclear discharge, as long as the proprietary confinement, energy extraction and load dump mechanism is utilized. (It is not practical to assess the risk of other confinement methods, other than to say that if energy build-up is improperly allowed to occur a confinement breach and instantaneous energy discharge can occur.) Worst case load removal and failure of the load dump only risks a \$25 million system replacement cost, about the cost of replacing a shorted-out generator in a conventional 300 MW system.

As a solution to the Economic Crisis there is no comparable technology available. No conventional, nuclear or alternative energy source can compete with neutron fusion's 8¢ per watt (or \$80,000 per MW) equipment cost, negligible fuel costs, reliability of service, ease of manufacturing and installation, or safety and cleanliness. It will replace all existing energy sources, free the US from foreign oil dependence, and revitalize productivity by offsetting higher US labor costs with lower energy and material costs.

#### **IV) Environmental Detoxification and Regeneration**

The Economic Crisis is serious, but pales in comparison to what Global Warming promises. In 2001 a UN sponsored study, dubbed "Hockey Stick Report" because of the resemblance of the last century's temperature rise to a hockey stick, showed an unmistakable tracking of global temperatures to fossil fuel consumption. For 1,000 years the average temperature was constant,

and then from 1900 it rose exponentially 1° C by 2000. One degree rise over a century might seem inconsequential, but the amount of heat needed to raise the earth's temperature that amount could not be met by 10,000 1-MT nuclear discharges.

To put the seriousness in a more tangible form, insurance claims for weather related damages rose 1400% over the last 25 years, compared to 300% over the previous 25. Both global temperatures and insurance claim increases have followed an exponential path, taking about 10 years to achieve a 10% increase initially, and a 100% increase per year toward the end.

Even more significant was the fact that temperatures rose 0.5° C by 1950, peaked at about 0.6° C, then fell to 0.2° C by 1975, and finally shot up to over 1° C by 2000. It did not just rise 1° C over a century, it rose slowly and then fell sharply over the first 75 years, and then exhibited almost the entire 1° C rise during the final 25 years. That is a classic refrigeration cycle signature, where the temperature rises, the refrigerator turns on until the temperature drops, and then it rises again.

When ice melts it absorbs heat energy at a faster rate, thus acting as a cooling cycle. The Hockey Stick's curve deviation coincides with the thawing of the permafrost, the largest absorber of carbon dioxide, and now one of the greatest sources of atmospheric methane as it decomposes, and equally damaging greenhouse gas. Now the permafrost is not only not absorbing CO<sup>2</sup>, it is contributing methane. A more accurate term than "global warming" would be "thermal cascade," like an avalanche or runaway nuclear reactor condition.

If these effects were confined to a localized area and period in time, then the media coverage would be equivalent to "9/11." But effects distributed globally and over time appear minor. The ice packs are thinning, major ice shelves are falling into the oceans, and the ice caps are shrinking. Hurricanes and tornadoes have increased in number and intensity, devastating populated areas. Cyclonic weather has appeared on the US west coast and Brazil's east coast, contrary to established weather patterns. Last but assuredly not least, forest fires have increased in frequency and intensity due to a drop in ambient moisture levels in forest regions.

It sounds more serious when the events are consolidated, and the greatest effects are yet to come as warming polar waters disrupt ocean food chains and shrinking ice caps reflect less sunlight back into space. The thermal cascade is now driven by four forces – CO<sup>2</sup> from fossil fuels, loss of permafrost CO<sup>2</sup> absorption, methane from permafrost decay, and increased solar energy absorption. This will be another multi-front war, far greater than any previously waged.

These superficial events, however, paint an incomplete picture. They are only the effects of underlying fundamental principles, like chemical reaction rates and equilibriums, Boltzman energy distributions, energy absorption into wave cycles, and other forms of energy transfer like ecotoxin diffusion rates, pathogen procreation, food chain disruption, and economic impact. It all compounds because everything is interactive on some level. The fisherman that went bankrupt, the cost of fighting forest fires, hurricane insurance claims, and increased medical expenses from pathogens all constitute economic loading.

The debate over global warming has raged on for decades. We have politicized a thermodynamic event and mitigated its seriousness. If anything, we have underestimated it, missing significant factors like the Hockey Stick's refrigeration cycle or the more subtle changes that go unnoticed because we don't see direct connections. When an ocean current shifts or a

new weather pattern occurs on opposite coasts in opposing hemispheres, it is nature's way of absorbing excess energy, by increasing wave-cycle frequency, decreasing its wavelength, but so is pathogen proliferation.

Each subtle change places a load on existing infrastructures, be it food chains, weather, or economies, until a threshold is reached that marks the difference between stability and cascade. Everything is just a form of energy, a different face, and they are all interrelated so the equilibrium of one depends on that of the other's. When one structure starts collapsing, all others are undergoing degeneration. We only notice changes on the face of things, and tend to miss undercurrent changes that are more important because they contain inertias that determine future events. We are in serious environmental trouble.

The obvious solution is to curtail fossil fuel combustion, but that is not going to be enough because of the negative inertias contained in the current degenerative conditions. We not only need to stop feeding the causes, we need to initiate affirmative action to reverse the damages. We are in a cascade and need to stabilize it. This means scrubbing CO<sup>2</sup> and methane from the atmosphere and restoring the permafrost and polar ice caps. These are monumental undertakings and will require massive efforts from governments that cannot even agree to limit their own greenhouse gas emissions.

With this in mind, the affirmative action to reverse environmental degeneration must be incorporated into the economic solution. For each neutron fusion unit produced to generate electricity, hydrogen and gasified coal fuels, one must also be produced to scrub CO<sup>2</sup> and methane from the atmosphere, regenerate the polar ice caps, and desalinate ocean water to irrigate arid regions for reforestation. This is not a matter for political debate, it is a simple matter of environmental and economic survival. The negative loading needs to be neutralized with the same resolve by which the profits that helped cause the problems were derived.

This does not need justification, it is just normal overhead to clean-up after ourselves, and implementing the solution at the source eliminates any need to politicize it. Ten thousand 300 MW refrigeration units at the poles would easily serve to restore the ice caps and remove the toxic concentrations of CO<sup>2</sup>. The oceans are not only being overfished, they are being reclimatezied by CO<sup>2</sup> acidification to the detriment of sea life, and ultimately man.

## **V) Conclusion**

Seven factories, each at a cost of \$100 million and producing ten 300 MW neutron fusion generators per day, at \$25 million each, would defund the Middle Eastern terrorists, inject \$700 billion annually back into our own economy, provide a secure energy source at labor rate adjusted cost so US productivity could be revitalized, reverse the ecological damage of a century within a decade, provide for countless jobs in a value added economic system, and most importantly, return the United States to center stage as the world economic and technological leader.

Such an undertaking might seem optimistic, but so was developing the A-bomb and going to the moon. No challenge has ever stood in our way for long; only the belief that we cannot do something ever defeats us. The alternatives to doing so – increasing terrorism, continued economic decline to former KGB analyst and current Dean of the Russian Foreign Ministry's

academy, Professor Igor Panarin's prediction of total collapse by 2010, and environmental degeneration – are unacceptable. One might have said that a \$3.69 trillion Wall Street bail out and a \$1 trillion Main Street stimulus package was optimistic. Seven factories at a cost of \$700 million, to build thirty five thousand 300 MW units funded from their own revenues is an inexpensive solution.

The present we experience is the future of our past acts. We have not done a good job. We have poisoned our economy, our air, our food chains, and our ecosystem, and we have undermined our world political position by shortsighted responses. It is time for an across-the-board reconstruction, one in which our economic, environmental, and political actions add value, instead of negative loading, and we need to do it now.