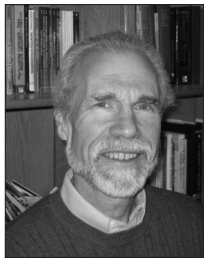

The Sorry History of Dealing with Imaginary Energy Shortages

Bill Zebuhr

A young person may think that we are very close to running out of energy and civilization is near collapse, but having lived through numerous crises starting with the oil embargo of late 1973 and being involved with conventional energy and the potential of better technology, I know better. Energy is massively abundant. Our gross ignorance and gross mismanagement of imaginary shortages is what makes it seem otherwise. Energy in all forms must be utilized with care, but that is more difficult in "crisis" mode.

During 1973 I was making weekly commutes between New York City and Nashua, New Hampshire and was well aware of the problem of getting gasoline. On one trip I was about to run out of gas in Connecticut and visualized getting off at the next exit, finding a hardware store and putting anything into the gas tank that would burn. It was a silly and desperate idea but it worked, because against all odds there was an open gas station that did not even have a line. It was common then to spend an hour getting a partial fill-up. Later that year I invented a heat exchanger that was designed to save energy and we built a company around it. It felt good to do so and it has saved millions of gallons of oil over the years but was just one of many efforts to reduce oil consumption. These were beneficial efforts that should have been done earlier but oil was so cheap that most of them would not have had a reasonable return on investment.

The oil embargo had nothing to do with oil shortages and everything to do with political power manipulation to the detriment of almost everyone involved. Oil was low in cost in Saudi Arabia because it was plentiful and easy to access. In spite of no real shortage and low cost, it was predicted that the world would run out of oil in 20 years. This was one of many such predictions over the next 45 years. All of them were wrong and we have always had about "20 years" worth of oil left in spite of vast increases in consumption. This is because of fundamental misconceptions about the origin of oil and, therefore, its potential quantity and location.

The perception that oil was scarce was used to the advantage of power hungry countries to help justify wars that have cost millions of lives and trillions of dollars. This is the worst aspect of handling the "energy crisis" to date, but others have been discussed that could be worse, such as world climate manipulation.

Oil is "known" as a "fossil" fuel and the perception is that it came from animal and plant life in the past. We have discussed the concepts of Thomas Gold in *IE* in the past. These include the ideas that methane and other hydrocarbons were entrained in the earth during formation of the earth and a deep hot biosphere that over long periods of time converts this to oil and eventually even black coal. People have been taught for many decades that the earth was formed hot, as molten rock, and this would eliminate the possibility of entraining gases, but the more enlightened view is that the earth and other planets were formed by agglomeration of material and that it would be cold, allowing for a wider variety of material in the crust. We now know the "gas giants" are largely made of gas and that there is a lot of methane and other gases in the solar system. People in the oil and gas industry may know this, although most don't seem to in this country. It is hard to see why it is so difficult for good ideas to overcome bad ones, but it is an integral part of world history. Proof that man as a species is not very smart. Very few make the advances and they are often ostracized or killed for it.

For the mainstream, science is the art of at least partially understanding what the majority consensus is and then agreeing with it. Even within the academic community it is known that often the consensus only changes one death at a time. This has the appearance of a religion rather than a serious process for learning about the universe. The problem of original thought has seriously increased due to government funding of most fundamental research and to fight the mainstream is to lose the latest handout. This has been shown many times. Gene Mallove discovered this at MIT and founded *IE* partly in reaction to it. This process has probably affected the energy field more than any other and the results spread to all aspects of society because without energy nothing happens.

Gene Mallove saw evidence of data tampering in a cold fusion experiment to protect the hot fusion stream of financing. In the ensuing 30 years neither has "saved the energy world" but a lot more of the fundamentals of materials are understood as a result of the work in cold fusion, now LENR, than the hot fusion work—and it has been done at a small fraction of the cost. It has also produced many overunity results, whereas the hot fusion work has only consumed a lot of energy and a lot more money.

Extreme tunnel vision, encouraged by billions of dollars from vested interests ranging from the oil industry to aca-

demic researchers, keeps the ball rolling to further enrich and empower these interests. Common wisdom has been that minimizing oil consumption is desirable to minimize pollution and extend the life of the resource. Engines are much less polluting and oil reserves are vast, but it is still a good idea. The problem is that many potentially competing technologies have been very slow to expand to enable a large reduction. Nuclear power could produce most electric power safely but has been stymied by a lot of false perceptions and use of a suboptimum approach that was chosen to work in conjunction with the production of nuclear weapons. The actual reduction in the use of oil and coal to generate power has come from plentiful natural gas, which is inherently less polluting and low in cost.

Hydro power is an excellent means of producing power in some cases and has been for centuries. Originally, small dams were placed in modest rivers that could be controlled and the delivered power was mechanical. Nikola Tesla opened the opportunity for large hydro-electric plants via his three-phase AC power and a large plant at Niagara Falls. Every site has an environmental impact and as more were used, the successive choices became less desirable and had larger negative impacts, some of which are long-term and yet to be discovered.

Solar and wind power are the popular feel good options at this point. There is no free lunch and these projects are expensive, intermittent in power delivery, take up a large amount of land and depend on government subsidies. They also only provide a few percent of the total energy used. I started a solar thermal company in the mid-1970s that built and installed solar thermal water heating and space heating systems in New England. It is not an easy business, but we had early success selling systems to people who were genuinely interested in solar for environmental and long-term economic reasons. Then the government got involved and offered subsidies and soon many competitors entered the field, some of whom bought and installed our systems but their primary selling point was the tax credits. This went on until the tax credits were withdrawn in 1985 and soon after virtually all solar companies disappeared. The interest is now almost all confined to PV systems delivering electric power. These are now at greatly reduced cost compared to the early years in the business but still depend on subsidies, which were reenacted.

Using solar energy can do more harm than good. Solar thermal systems, which can be 70% efficient, are more efficient than PV systems which are more like 10 to 15% efficient for the same input. Passive solar thermal heating systems can be simple but effective. They can range from simple, large south-facing windows to large windows and roof overhang to shade the summer sun to systems that have some thermal storage as well. I built a passive solar house in New Hampshire in 1972 that has a five foot overhang and large south-facing windows. A substantial portion of the heating was originally contributed by the solar input but over the years the pine trees out front grew to over 100 feet tall and effectively blocked most of the direct winter sun. I would not cut trees to get solar energy, but this is becoming more common now with PV systems due to tax credits. Also, even in New England I now see substantial solar arrays on the ground. Solar arrays on the roof make sense, although it is common to see them facing suspect directions. But I think the best use of solar energy is to grow plants because they are the earth's climate control system. Solar arrays in a desert may be fine but not where there is plenty of water to put the land to better use. About 90% of my heat now comes from burning wood that otherwise would be lying all over or in dead trees and could present some hazard from falling wood or a brush fire, for example.

Wind power has been around for centuries like hydro power but did not become even remotely competitive in electric power generation until the second generation of turbines that were much larger than the first generation produced in the 1980s. They are now huge and getting bigger. The blades are the size of large airplane wings and the towers are the height of skyscrapers. There is significant environmental impact in delivering and installing these in anything but flat, open fields. Roads are built, trees cut and large foundations of concrete and steel are installed before large cranes are brought in for the erection of the tower and blades. They depend on subsidies like the solar systems.

When viewed from the perspective of total energy produced versus the total negative impacts on the earth ecosystem, nuclear in some form is very likely the best option at this point. It is the way nature does it via the sun and stars and the amount of material that must be handled is minute compared to using coal or oil. Even using the current suboptimum solution, there is a virtually unlimited supply of raw material available. Using better technology, which is known, the safety would improve, the waste problem would be greatly diminished because it would not be dangerous and the economics would be better. Hot fusion may happen eventually but seems to be always 30 years away in spite of billions of dollars spent. Using LENR when it is developed following the best current thinking could be much lower in cost, more flexible in operation and have less environmental impact than the other options.

The best long run solution is not known at this point but it may involve somehow getting energy from the environment, which could be the aether—something mainstream scientists seem unaware of. This option has been hinted at a number of times by various devices that apparently produce energy with no conventionally known input, including the Manelas device previously described in *IE* (Issue 141).

Fuel and potential energy is plentiful now and can be for a long time, but other serious problems must be addressed to help assure that time. The first step is to stop making the problems bigger and avoid insane suggestions like blocking the sun to prevent "global warming," which could start a new ice age. The next step is to get knowledgeable. CO_2 and sunlight are essential for life and if you believe CO_2 is a pollutant you have to call every animal, including yourself, a polluter because animals emit it. Look elsewhere for solutions. So-called scientists are suggesting playing with something they are still quite ignorant of and that they would take action on based on the prevailing "scientific" religion. The ecosystem must be preserved by using resources wisely and ultimately limiting the world population.

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