

# BREAKING THROUGH EDITORIAL



## The Politics of New Energy

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In his address to a joint session of Congress on February 24, 2009, U.S. President Barack Obama said:

The only way this century will be another American century is if we confront at last the price of our dependence on oil. . . We have known for decades that our survival depends on finding new sources of energy, yet we import more oil today than ever before.

In other words, right now our government ranks energy as the top priority of the \$787 billion financial stimulus act. In particular, \$16.8 billion has been allocated to the DOE Office of Energy Efficiency and Renewable Energy (EERE). This is nearly a tenfold increase of the EERE budget for the year 2008. Most important for readers of *Infinite Energy* is that \$400 million will support the establishment of the Advanced Research Projects Agency—Energy (ARPA-E), an agency for innovative energy research, modeled on the Defense Advanced Research Projects Agency (DARPA). This must have been unexpectedly good news to the readership of our magazine. Will your concerns be heeded and your voices be heard?

Obama's pleading reminds me of the 1973 Middle East oil embargo and the long lines at the gas pumps. The American government responded with the formation of the Department of Energy (DOE) with an Energy Secretary in the President's cabinet. What has been the result of this political action taken 36 years ago? DOE certainly survived and this is no mean achievement. A number of national energy laboratories have been created. Amongst them is the National Renewable Energy Laboratory (NREL) in Golden, Colorado.

With a staff of 1,200 and an annual budget of over \$200 million, NREL has certainly accelerated the creation of renewable energy with photovoltaic cells, wind turbines, geothermal heating, biofuel technology, and more. Despite these government driven efforts, as President Obama observed, the U.S. is importing more oil in 2009 than in 1973. No doubt, one reason for this is the continuous growth of the population. The expansion of existing renewable energy technology may keep the emission of greenhouse gases into the atmosphere constant despite the increasing population, but, as implied by the President, in order to come to terms with global warming and oil inde-

pendence, we have to find new clean energy sources. None have been found in the last 36 years.

DOE pinned its hope on hot thermonuclear fusion of hydrogen isotopes. This project was started in the middle of the twentieth century and has absorbed billions of tax dollars. At best it may come to fruition in the middle of the twenty-first century. Multi-national collaboration on the International Thermonuclear Experimental Reactor (ITER) underscores the fact that other industrial nations have also failed to find a new, clean source of energy which can seriously compete with fossil fuels. So far political pressure has not come to terms with global warming. What seems to be required is a concentrated scientific and technological R&D effort which generates substantial quantities of renewable energy. The incentive for this should be fostered by the government.

Democratic governments are not well qualified to choose a promising field of fundamental research. Early on in this process, the best ideas are usually rejected by conservative committee votes. Government can, however, step in once the crucial scientific discovery has been made, but a large body of technology remains to convert the discovery to practical success. Consider the initiation of the Manhattan project by President Roosevelt in World War II. The scientific discovery was the splitting of the uranium nucleus in 1938. It had to be followed up with a vast amount of engineering and invention to harness the energy released in splitting atomic nuclei. It was this follow-up technology which made Roosevelt's Manhattan Project hugely successful.

Has the critical discovery in energy science been made? Ordinary nuclear fission energy is not a contender because, so far, it has not been made renewable. It consumes the rare element of uranium and produces dangerous waste products. As argued in the editorial of *IE* #77 ("Manhattan or Kyoto"), three aspects of water qualify as new energy sources. The first one is an idea by Dr. Randell Mills, the founder of BlackLight Power, Inc., in New Jersey. This postulates that quantum mechanics is incomplete in not allowing the hydrogen atom to assume a lower energy state than the so-called ground state. Mills calls the low-energy hydrogen atoms hydrinos. In the transition from hydrogen to hydrino, the atom should release energy in the form of kinetic energy or electromagnetic radiation. This is the new energy

source. It could be called renewable energy if the hydrinos later manage to absorb ambient heat or radiation that converts them back up to the ground state.

Experiments designed by BlackLight Power apparently confirm the energy gain. The experiments have been substantiated by several outside agencies. It is this experimental evidence which justifies government support, if necessary, by a Manhattan style project. Whether or not the hydrino mechanism is the explanation of the energy gain is unimportant. Until now the Department of Energy has revealed no interest in the BlackLight Power initiative of developing an alternative energy source.

The second water project ripe for political support is the Pons and Fleischmann effect of generating heat with heavy water in an electrolytic cell. This science led to the founding of *Infinite Energy* magazine in the capable hands of Eugene Mallove. Almost twenty years after this crucial experimental discovery, the latest issue of *IE* (#84) makes it abundantly clear that the scientific comprehension of the Pons and Fleischmann effect is no longer questioned and it is set for government involvement. It must first be determined, however, how this form of water energy can be utilized to alleviate the energy crisis. Secondly, DOE has to marshal the engineering resources to implement the exploitation of the P&F effect.

In recent years the P&F effect has become known as Low Energy Nuclear Reaction (LENR). The same acronym also describes Lattice-Enabled Nuclear Reactions. The latter wording is a hint that chemical energy may participate in the release of nuclear energy. It is not out of the question that this chemical energy is actually hydrogen bond energy of water.

Hydrogen bond energy is the third form of water energy that may now be politicized. This is to say, it should be taken up by the U.S. National Renewable Energy Laboratory. The phenomenon of the liberation of inter-molecular water bond energy was discovered in 1994 when Richard Hull, and others, produced video-stills of fog jet explosions, as the one shown on the cover of the booklet *Unlimited Renewable Solar Energy from Water*. The fog jets were proof of the rupture of hydrogen bonds. The force of the explosion indicated the liberation of chemical bond energy.

The important technological discovery of how to liberate large quantities of hydrogen bond energy has also been made. It concerns the recognition that hurricanes are driven by hydrogen bond energy (*IE* #74). This is to say, large numbers of hydrogen bonds can be ruptured by drag-force tension between water and air or another medium, such as a turbine blade. While the earlier tensile rupture of hydrogen bonds in water arcs was scientifically very instructive, it is not obvious how water arcs can feed mega-watt renewable electricity generators. The prospect of bond rupture by rubbing water against metal surfaces has enormous practical consequences. Already pointed out in *IE* #78, it could possibly supply 5% of all our electricity by upgrading existing hydroelectric turbines.

Although it was not realized at the time, in 1998, a most promising experimental finding has been that a high speed jet of water fog impinging on a metal plate accelerates away sideways from the impact area without losing speed due to turbulence and friction. This completely unexpected result could be repeated at will, but numerical results are only

available for one shot. It is possible that an impact gain of kinetic water energy may be produced when a waterfall strikes a rigid horizontal surface of rock or metal. Such an effect directs attention to the hydroelectric turbine in so far that liberated hydrogen bond energy could be added to the gravitational energy of falling water.

In order to bring the hydrogen bond energy project to fruition, the first task of a government agency would be to convince the chemistry community that the widely discussed inter-molecular ( $H_2O-H_2O$ ) bonds are regular chemical bonds which store potential energy like the chemical bonds of all fossil fuels. As far as we can determine, the existence of hydrogen bond energy is not denied. Yet the total absence of any discussion of this energy in classrooms and in chemistry textbooks is a severe stumbling block to advancement in this renewable energy endeavor.

In March 1989 the University of Utah announced that energy (heat) could be gained from heavy water by a process they described as cold fusion. Within weeks the nuclear physics community raised a storm of criticism. Many scientists worldwide and government committees argued that the laws of nature forbid cold fusion reactions to take place. A considerable number of researchers continue to work on cold fusion today, in 2009, but public opinion still considers their efforts futile. Changing public opinion is a political task.

In 1996 I made an announcement at the 4th World Renewable Energy Congress in Denver, Colorado. It claimed in the conference proceedings ("Gaining Solar Energy from Ordinary Water") that we had found an unexpected and gainful way of extracting chemical bond energy from ordinary water without producing carbon dioxide. With the cold fusion debacle in mind, I felt uncertain of how my paper would be received. The fact that it was selected for presentation at the congress by scientists of the National Renewable Energy Laboratory should have reassured me. The conference of more than 1,000 participants accepted my announcement silently. Some of the renewable energy experts made encouraging remarks in the corridors of the conference. What is the lesson to be learned from this experience?

The politics of energy are such that competent discoveries of new sources of energy are disbelieved, or at any rate ignored, until a substantial fraction of the public clamors for them. Therefore, when the search for alternative energy sources becomes urgent, as it does at the present time, the government should allow for the skepticism of experts and the lay public and order follow-up experiments to resolve the credibility issue and provide publicity. To allow promising proposals to alleviate the shortage of clean energy drift along under a cloud of uncertainty is irresponsible.

With the financial resources now being made available to the Department of Energy by the Obama Administration, the way is clear for the development of the first major new energy source. This should be hydrogen bond energy of ordinary water, the energy that drives hurricanes. What is required next is a well-instrumented experiment in which the velocity of water falling vertically on a horizontal metal plate can be measured and compared with the velocity of the water spreading out laterally on the plate. There is good reason to believe that the kinetic energy of the falling water can be doubled, or perhaps tripled, by hydrogen bond ruptures at the impact area.

If this is found to be true, we can devise water turbines, like the spider turbine of *IE* #78, which convert the deflected horizontal kinetic water energy into electricity that can be fed directly into the existing power distribution system. The development of the up-graded hydroelectric turbines to replace the turbines of existing hydroelectric plants will take years and cost millions of dollars, but not billions of dollars. No new dams and waterways will be required.

The water discharged from the upgraded hydroelectric turbines will eventually evaporate and rise to the level of clouds. There it is condensed and will fall back on earth as rain to do another cycle of electricity generation in another turbine. Hence the proposed new energy source is perfectly renewable and clean solar energy. We may finally have found a way of converting chemical energy to electricity without producing greenhouse gas.

Most readers of *Infinite Energy* will not be in a position to develop upgraded hydroelectric turbines in the mega-watt range. But they can contribute to the enterprise with experiments demonstrating the liberation of hydrogen bond energy. Modest private laboratory facilities should be sufficient to devise techniques of determining the speed of a falling jet of water and the horizontal velocity with which the water flows away from the jet impact area. *Infinite Energy* will be glad to consider the publication of the results. They may well find their way into newspapers and other news media to reach the public at large.