Japan announces major funding for cold fusion research program

by Carol White and Christopher White

On July 10, the Japanese Ministry of International Trade and Industry (MITI) announced a proposal for a national commitment to launch a full-scale program to develop "cold fusion"—a new form of nuclear fusion energy—over the next five years. This is in stark contrast to the situation in the United States, which virtually witchhunted cold fusion's discoverers Stanley Pons and Martin Fleischmann out of the country, and treated other cold fusion researchers in similar fashion.

The money figure quoted was tens of millions of dollars over the five-year period, but it is rumored that the actual figure will be closer to $100 million—half to be contributed by industry and half by government. According to the MITI announcement, the first phase of the program is to be devoted to finding stable experimental methods to create excess heat, and to achieving precise measurements and diagnostics. They will also be trying to answer the question of precisely what the mechanism is by which cold "fusion" occurs.

In their front-page coverage on July 11, Japan's leading daily newspaper *Yomiuri* accurately described cold fusion in a way which rarely finds its way into the U.S. press (with the exception of this magazine and a few other journals). *Yomiuri* called cold fusion the "ideal form of energy for the 21st century." Coverage also appeared in that newspaper on July 10, and on NHK television on its July 12 news broadcast. *Nikkei Shimbun* likewise covered the story on July 11. But so far it has not been picked up by the major U.S. press.

The impressive results by cold fusion researcher Akito Takahashi, (reported in detail in *EIR* on March 20) are cited as a basis for this dramatic commitment. As he told *Yomiuri,* "The cause of the effect is still unknown, but there is no doubt that the effect is occurring. The problem is how to sustain the reaction. The amount of heat our experiment yielded makes it certain that this can only be some sort of nuclear reaction. It is not such a miracle that deuterons [heavy hydrogen nuclei] closely packed in the palladium lattice should undergo some sort of nuclear reaction. I am very pleased to see a national effort to crack this problem. I rate the new program very highly. It is solid recognition of this as a potentially unlimited energy source."

The truth about 'Japan, Inc.'

Not only were Fleischmann and Pons hounded out of the United States, but hegemonic scientific institutions here are on record calling experiments in cold fusion "pathological science" and similar epithets. While some U.S. scientists have pursued this research despite the pressure brought to bear against them, they have been badly underfunded, and—equally serious—they have been ridiculed by many of their colleagues. The situation is no better in Germany, where researchers who receive government money are explicitly forbidden to use it to explore the phenomenon of cold fusion.

One major U.S. cold fusion research group is located at Stanford Research Institute (SRI), which is funded by the Electric Power Research Institute (EPRI); but even they have had to adopt an extremely defensive public posture about what they have been doing. SRI has even had to suspend research in its own laboratory, due to underfunding. But now the Japanese program will far outscale the $12 million, spread over four years, which has been granted to SRI by EPRI.

Unless this situation changes rapidly in the United States, we are likely to see another case in which the Japanese develop capabilities which the United States has willfully given up, only to complain later about "unfair Japanese competition."

According to the MITI release, as reported in *Yomiuri,* the program will be run under the auspices of an agency affiliated with MITI, the Natural Resource and Energy Agency, which is described as a hydrogen energy study group. It will include pure science researchers as well as staff provided by the power companies and large electric machinery producers. They will be looking at applications relating to electric batteries, and perhaps desalination, but they question whether the new technology will be applicable to large-scale power generation.

The research proposal highlights anew what the function of Japan's Ministry of International Trade and Industry actually is, as opposed to what the "Japan bashers" claim it to be. MITI is viewed here as the principal coordinating agency for something called "Japan, Inc.," whence orders are issued

which result in resource deployment decisions by large corporations such as the auto and electrical appliance companies.

More than 99% of Japan's businesses are small to medium-sized. These companies account for about 54% of Japan's output. Under legislation adopted in the 1950s and 1960s, MITI has the special economic function of safeguarding the in-depth, innovative characteristics which are uniquely associated with small and medium-sized business. This is the same kind of idea which is found in Germany's conception of the *Mittelstand*. MITI performs functions which small companies are unable to perform for themselves. This includes, for example, providing credit to ensure that technological innovations are not stillborn because of hidebound financier insistence on only investing in "proven technologies," providing scientific, technical, and engineering expertise to permit small companies to bring innovative development potentials to fruition, and providing management support and backup to help such companies function.

More than 60% of MITI's official budget is allocated for the promotion of research into alternate sources of energy. Such research has been focused over the last 15 years through Project Sunlight and Project Moonlight—efforts to create a viable technological and industrial alternative to fossil fuel-based thermal technologies. The development of alternative power sources for transportation is high on MITI's list.

Not too well known outside Japan is the effort to develop power systems for automobiles based either on battery sources—fuel-cell type arrangements featuring metal hydride storage units—or liquid and gaseous hydrogen systems.

The small companies are often suppliers of parts and semi-finished goods for the big giants. MITI's efforts help ensure that momentum for technological advance can be maintained in the giant companies. This seems also to hold true for the question of new power sources for the auto industry.

Tokyo's electric utility, Tokyo Electric Power Company, which has its own developmental model electric car, is currently working on options for infrastructure changes to support use of electric cars. Matsushita and other appliance companies are also part of the electric car race. This fall, Daihatsu will begin test-marketing electric scooters to build up consumers' familiarity with the concept of electrically powered vehicles. Mazda corporation is working on developing the infrastructure for its hydrogen-powered vehicle concepts, using hydrogen supplies pumped via pipeline from the off-gasses of steel and chemical industries. Mazda's hydrogen-powered car will probably be an early victor when California's new auto emission laws take effect.

The depth of corporate involvement in these efforts provide some background to reports now circulating that at least 20 of Japan's corporations have signed on for the cold fusion program.

New science in the making

Around the world, scientists have replicated the Fleischmann-Pons experiment at least to the point of getting up to 50% excess heat, at relatively low power densities. In this regard, Dr. Takahashi is unique in his reported results. In a four-month experiment, Takahashi achieved 70% excess heat and excess power densities as high as 100 watts per cubic centimeter. Pons and Fleischmann have estimated that they achieve excess heat in the range of one kilowatt per cubic centimeter. Both the Japanese program overall, and that of SRI, are unique in rigorously developing systematic protocols to place every aspect of the experiment *under the microscope*. But by the nature of the case, this has been insufficient to master the phenomenon.

Cold fusion demands a new inter-disciplinary approach to examining the axiomatic assumptions of present-day science. As its opponents are fond of pointing out, by the laws commonly accepted by physicists, cold fusion simply cannot occur; yet, as countless experiments have shown, it does. The promotional blurb on the poster for the Third International Conference on Cold Fusion, to be held in Nagoya, Japan on Oct. 21-25, states the present position accurately: "The confirmation of cold fusion has crossed the ridge. We are now in the stage of accumulating experimental results and analyzing the mechanism of these phenomena." From such a rigorous program will come the experience necessary to substantiate or reject hypotheses, from among the various theories of why cold fusion occurs, or perhaps to generate entirely new ones.

There is, of course, still no theory, or even adequate model, to explain the anomalous results of the Fleischmann-Pons experiment. How can it be that the nuclei of two hydrogen atoms (actually, the deuterons of heavy hydrogen, which contain a neutron as well as a proton) can fuse together at room temperature? This is a question that many physicists have found so challenging that they refuse to accept the reality of the experimental evidence put before their eyes. The experiment typically is conducted in a small glass jar (or metal container) in which there is a palladium cathode (negatively charged electrode) of a size under a cubic centimeter in volume, and a platinum anode (positively charged electrode) wound around it. Deuterium is released from the heavy water by electrolysis, and is "pumped" into the palladium, to something close to a one-to-one ratio with the palladium atoms. At these densities, a nuclear process occurs which sometimes produces a release of neutrons, sometimes produces tritium (an isotope of hydrogen), and sometimes produces heat far in excess of any possible chemical reaction. These results may or may not occur together.

The Japanese program has been welcomed by cold fusion researchers all around the world. Even before this, a visit to Japan by a team from EPRI and SRI, led by Dr. Thomas Passell, expressed their confidence that greater international collaboration was in the offing.