

Cold Fusion Development Plan

An active research and development plan is needed to make commercial cold fusion heaters a reality. It is important to organize the core program around skills that relate to the A-Z research successes. The overall program should be a broad one, and address both deuterium flow processes and elevated temperature gas loading, plus their combined use. The development of composite materials and their characterization should share top priority along with testing for cold fusion heat. Testing of $ZrO_2 + nanoNi$ composite for excess heat is especially important. It is about 500 times less expensive than Pd on a per atom basis. The program should be one that provides research and development funding over the long term. The inclusion of a basic research component is almost essential. The potential for application is large.

The structure and means for an effective development plan are to be determined (TBD).

Today's world wide research effort in the cold fusion and related cold fusion areas is in trouble. The present generation of dedicated scientists that have kept the cold fusion art advancing are growing old and disappearing as active hands-on workers. There are almost no young scientists doing active research, or studying the pertinent science. The history of successful experiments is almost unknown to both teachers and students, and the research publications describing these studies are not archived in most libraries. There is no consensus on theory. Almost the entire "cold fusion" community is thinking in terms of high density configurations or energized deuteron concepts. These classical concepts can only explain forms of fusion which produce energetic particle emission. Cold fusion is not that kind of fusion. Geometric quantum symmetries prevent cold fusion from producing high energy emissions. Solid state cold fusion physics enables nuclear energy to heat a hosting metal by solid state mechanisms that resemble the heating of a wire by an electrical current.

In terms of resources available in the US, one plan for the future would be the establishment of a government supported effort with a minimum commitment of 5 to 10 years. One cannot expect top quality young professionals to take the risk of joining an effort that does not guarantee stable employment. It usually takes as much as 3 years for a scientist entering a new field to learn enough to make a positive contribution. Things are better if there is an active group already present. If you consider one or two competent professionals to be such a group, there are only a few such groups in the US. The Departments of Energy and Defense are potential sponsors, and the fact that the space exploration program will greatly benefit suggests

that NASA could be a potential sponsor. There is difficulty in getting government support as long as professional scientific organizations fail to seriously examine the cold fusion option. A positive step would be for Congress to fund the National Academy of Science to examine the cold fusion field.

Other support possibilities should be explored. A profit-motivated enterprise could take a long term view and invest in what they would initially feel to be high risk, high payoff technology. There is a danger in this approach. If the enterprise sought to protect its early efforts by Patent rights, its work would not be shared with the global community, and it would in turn be isolated from the cooperative world effort that has kept this research alive thus far. This problem could be avoided if the profit-motivated enterprises agreed to openly share all the results they obtained during the initial years of their work. They would be basing their hope for future profit on the expectation that the accumulating corporate expertise and the research by-products would provide them a technical advantage, leading to commercial success in the market place.

Another option would be for a Foundation or other non-profit individual or organization to provide the financial support needed. It would be most effective if the benefactor found a way to build on a currently successful program. Technology leadership is in Japan, but even the Japanese effort is fragile. A non-profit's support of an international program would be the surest means for quickly bringing cold fusion energy to commercial reality. Commitment over a 5 - 10 year period is more important than dedication of a larger amount of funds for a shorter period.

In structuring the development effort, it is important that materials research and characterization play a key role. Materials research is needed in conjunction with laboratory studies on heat generation and process reproducibility, which in turn are needed for guiding device design, testing, and engineering. Over the near future, duplication of effort should be encouraged and not avoided. It is advised that some of the materials development and evaluation studies should be done in close proximity and/or be closely coupled to the design and testing of developmental cold fusion heaters. Experiment and testing will probably continue to guide theory rather than theory guide experiment over the next few years. Both theory and modeling need to be supported. Theory should include both solid state computer modeling of candidate materials and a more basic modeling of the underlying physics process.

Other countries face similar problems. Maybe a multinational program could sponsor the needed research.

