Written by **James Heiser** on October 26, 2009

Energy Dept. Funds Speculative Science

Have you been watching the nation's economy continue to unravel and wondering where all of that stimulus money went? Another $400 million of the $787 billion approved last February in the American Recovery and Reinvestment Act have been accounted for, this time at the federal Energy Department. Why did the Energy Department receive these funds? To support technological research that, in many cases, is so speculative that it apparently cannot attract private venture capital.

According to an article in the New York Times ("Energy Dept. Aid for Scientists on the Edge"),

> the federal Energy Department will make good on a pledge for a bolder technology strategy on Monday, awarding research grants for ideas like bacteria that will make gasoline, enzymes that will capture carbon dioxide to counter global warming and batteries so cheap that they will allow the use of solar power all night long.

A new agency within the department will nurture these and other radical proposals, most of which will probably fail but a few of which could have "a transformative impact," Energy Secretary Steven Chu said in an interview on Friday. The money will go for projects at all stages of development, including some that exist simply as a smart idea, Dr. Chu said.
The department will announce 37 grants totaling $151 million, mostly going to small businesses and educational institutions but also to a few corporations. Some of the ideas may be supported until they are picked up by venture capitalists or major companies, he said.

The first 37 grants are only the start; a total of $400 million in expenditures have been authorized over the next two years, and federal agencies are reticent to fall short of spending all that has been budgeted, since that may prove the most efficient way to have one's budget cut.

The Energy Department program, which is called the Advanced Research Projects Agency-Energy, or Arpa-e, is, according to the New York Times, "modeled on a Defense Department program known as Darpa that helped commercialize microchips and the Internet and helped develop body armor and other high-tech products. Darpa is known for quick decisions and long-shot bets, an approach seldom associated with the Energy Department."

According to the Arpa-e website, "The grants will go to projects with lead researchers in 17 states. Of the lead recipients, 43% are small businesses, 35% are educational institutions, and 19% are large corporations." Apart from the fundamental question of the constitutionality of such government sponsorship of private research, other questions readily leap to mind: Even if one were to grant the 'need' of a small business for assistance funding research, why are 19 percent of the grants going to (in Arpa-e's assessment) "large corporations"? Why should citizens get the bill for speculative research undertaken by "large corporations" in the development of technologies that are, ostensibly, for their

private, corporate financial benefit?

The initial selectees for funding reflect the 'green economy' one might readily anticipate, and the project descriptions are primarily access in terms such as "renewable power," "energy storage," and "biomass energy." For example, the largest grant among the first 37 was given to Foro Energy, Inc. of Littleton, Colorado: a total of $9,151,300 was given for

> ***Renewable Power*** (geothermal) A new hybrid thermal/mechanical drilling technology for much faster drilling with less wear and tear on the drill bit. Could open up cost effective access to the geothermal energy in deep, hard basement rock, a potentially huge new source of domestically available, carbon-free baseload power.

The second largest grant — a tidy $9 million — went to Du Pont (Bio Architecture Lab) for

> ***Biomass Energy*** Production of bio-butanol, an advanced biofuel, from macroalgae (seaweed). Seaweed is a potentially sustainable and scalable new source of biomass that doesn't require arable land or potable water.

The Arpa-e expenditures are only a small port of the $36.7 billion the Department of Energy received as part of the American Recovery and Reinvestment Act. In a year when expenditures, bailouts, and proposed programs are being made with little concern for the hundreds of billions of dollars scribbled on the price tags, perhaps the Department of Energy's Arpa-e/'Mad Scientist Assistance Program' may not seem like that big of a deal. With the Departments of Defense and Energy now equipped with there own technological think tanks in the form of Darpa and Arpa-e, one wonders: What's next? The Department of Agriculture's Broadly Underwritten Benevolence Bank-Agriculture?

With the federal government's 'alphabet soup' of agencies, one could quickly establish a bailout for every unemployed postdoc's startup corporation. But is it the business of the federal government to pick 'winners and losers' among the possibilities for researching new technologies?

According to the *New York Times*,

> In the initial round, the grants average $4 million. One is going to researchers at the University of Minnesota's Twin Cities campus who are working on developing an organism that uses sunlight to convert carbon dioxide into sugars and another that converts the sugars to gasoline and diesel. The two can live in a "co-culture" in a thin latex film, according to Lawrence P. Wackett, a professor of biochemistry, although much research remains to be done to make the organisms work as a system.

"A venture capital group might say it's a little early for them," Dr. Wackett said.

> "It's not all worked out, but that's the spirit of Arpa-e," he said. "It's not supposed to be things that are 90 percent worked out, but more what-if kinds of things."

"What-if kinds of things"? On the face of it, that seems like a pretty loose selection criteria, even by the standards of the federal government. Perhaps the Department of Energy would be interested in a plan for converting a DeLorean to use "green" nuclear power in a bold research project to develop time-travel technology? A proposal along these lines grossed $380 million at the box office in 1985; it could be just the breakthrough for which Arpa-e is looking.