YATER

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Bureaucracy keeps energy tool untested

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WASHINGTON — Is it possible that an energy breakthrough the world urgently needs could be stalled almost four years in the federal bureaucracy?

Yes, it is possible.

This is the story of an invention that *might* be the long-awaited breakthrough. No one knows because for years it has remained a theory, waiting to be tested.

It is also the story of a small, independent inventor who believed the government's promise of help — and has lived to wish he hadn't.

Joseph C. Yater's invention would convert heat — including the sun's — to electricity. That is done now with costly photovoltaic cells at about 15 percent efficiency. Yater claims his converter would be inexpensive — about $200 — and up to 90 percent efficient.

If it worked, a yard-square gadget on the roof would provide enough electricity to heat a house, cool it and run its appliances — simply and cleanly. The concept could double the output of conventional power plants — and reduce the need for them.

Yater's basic idea is to capture the tiny amount of energy produced when electrons are heated. Called fluctuation voltage, it is heard as static on radios and amplifiers. Using millions of microcircuits, Yater's invention could turn the fluctuation voltage into large amounts of usable electricity.

The Energy Department once declared that the idea had "significant potential" and promised a working model "within six to 12 months." That was three years ago.

The model never got built, and 18 months later the department rejected the idea. But Yater remained confident and tenacious — and the government now is taking another look.

The tale of the invention's empty years is not exciting. It is too governmental, too technical. It has no villains, no scapegoats and as yet no happy ending.

Inventor Yater is a consulting physicist in Lincoln, Mass. — a man rich only in professional credits. His wife works to keep two daughters in college.

Yater holds degrees from the University of Texas and University of California, and has completed doctoral studies at the University of Buffalo. He has worked in space physics, sensor and data collection systems, thermal design of power systems and statistical mechanics. He holds a patent on a communications satellite.

On Sept. 13, 1965, Yater took his theory to the energy-related inventions office of the National Bureau of Standards — created to look into promising innovations by small inventors, specifically ideas with a high risk of failure.

"I don't know anything that fit the category better than my invention," said Yater, adding that any invention is risky until a working model is made.

Three separate evaluations and nine months later, the bureau pronounced the invention "theoretically sound." A study by the Massachusetts Institute of Technology had also found it "theoretically plausible" — needing only a working model.

Recommending that a model be built, the bureau sent it off to the Energy Department — then known as the Energy Research and Development Administration.

In June 1976, Assistant Administrator Dr. Robert Hirsch told a House subcommittee he was "enthused" about Yater's invention, would "follow up vigorously" and "you can rest assured this will not fall between the cracks."

Hirsch estimated that building a model would take six months to a year, with "a very high probability that a demonstration model can be built that will work."

The chairman of the subcommittee — on conservation, energy and natural resources — was Leo J. Ryan of San Mateo, the congressman slain in Guyana last November.

Ryan became Yater's biggest supporter in Congress, declaring his invention could be the greatest of the last half of the century. Rep. Richardson Preyer, D-N.C., called Yater's testimony "mind-boggling."

But Yater was not told to start building his model. Instead, he was given a $40,000 grant to write his final proposal and to satisfy questions about materials and technology needed for a model.

It was the summer of 1977 — almost two years after the government first saw Yater's idea — that his completed proposal was submitted to a panel of five unidentified experts, selected by the Energy Department.

Months later came a devastating blow. The review panel called his invention impractical, saying it was not worth spending the public's money to pursue.

The inventor was not told why the panel reacted negatively, only that the Energy Department "will not support further effort on your concept."

The project looked dead.

Last August one panelist, an Energy Department employee, published a paper asserting that the invention's theory was incorrect and stating it would be too difficult and costly to fabricate.

Yater charged the panelist's conclusions were based on errors in basic physics and he demanded his material be submitted to other scientists to judge.

Ryan joined the battle to revive the government effort. He charged that the Energy Department had no real interest in alternatives to nuclear power and instead of helping to produce Yater's invention had thrown up roadblocks.

Last August — three months before his death — Ryan succeeded in getting Yater a second review by the Bureau of Standards. It was based on Yater's discovery that he could use simplified circuitry to produce a model for $100,000 to $200,000 — instead of the $750,000 he originally estimated.

The inventor decided not to try new approaches to the department, but to wait out the bureau's new review. It is still under way, with no timetable for its conclusion.

Meanwhile, Yater claims his paper refuting the energy panel's findings has been accepted by Physical Review — the journal of the American Physical Society — for publication in August.

In January, a discouraged Yater sent off two appeals to President Carter. He said a promising theory was in danger of being lost without trial and pleaded for a fresh start and a chance to build a model.

He also abandoned any profit motive, offering his invention to a non-profit corporation that could give all its benefits to "all people everywhere."

No replies came from the White House. Instead, the letters were routinely routed to the Energy Department.

That began a fresh exchange of letters this spring between the inventor and the department's research director, Dr. John M. Deutch.

At first, Deutch's letters seemed cool and formal. But Yater persisted. And last month the department agreed to accept another proposal and appoint another panel to review it.

Yater believes he has come full circle, but is again optimistic.

He believes he could produce a working model for less money than the government has already spent evaluating whether to build it.

"It is one of the most thoroughly evaluated inventions ever," Yater commented. "Most don't get so much analysis before any effort to produce a practical device.

"It is distressing that this invention — with such great promise — has stood still so long."

Even the work he might have been doing alone has been turned off while he seeks a fresh start with the government, Yater pointed out. So the last two years "have been unproductive."

Meanwhile, the world waits for a breakthrough.