

New Energy News

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ITEMS FOR NEN

If you find new-energy items that you believe others would like to read, send them by mail or email to us and we will give credit to the first person that sends in any particular item. Your help will make NEN a better source of new-energy information for all of us.

INE Annual Membership fees are **\$35.00**, which entitles members to an NEN subscription and INE website password information. If you have a friend or associate who would like to become a member please share this information.

INE Mail Address: The Institute for New Energy (INE), 3084 E. 3300 South, Salt Lake City, UT 84109-2154.

An annual INE membership is also available along with four quarterly issues of the technical magazine "Journal of New Energy", for a payment of \$150.00 per year to the Emerging Energy Marketing Firm (EEMF) at the INE address.

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THE INE WEBSITE - TO BE UPGRADED

Submitted by Patrick Bailey

<http://www.padrak.com/ine/>

The INE website was established on January 27, 1996. Since that time, the website contents have been almost entirely text, with no frames, and all almost all references on the main page. This was done so that anyone anywhere in the world with any Internet browser could quickly access our information. The major rule for the INE website has been that it always works for anyone - so many suggested changes were not implemented.

The INE website now needs to be upgraded. Please email your suggestions to ine@padrak.com.

My current vision is to have a small main page with topical links, which reference topic pages - which in turn reference the final webpages. In other words, the existing main page would be cut into pieces (topics), and each piece would become a new intermediate webpage. Pictures would also be continued to be discouraged, as one color picture can take up as much room as the entire INE Database text. Picture links referencing other website pictures could be used anywhere - as long as we do not have to store the pictures on our disk space, and as long as those pictures do not go away. (Note that any real interesting news and useful pictures in the news almost always "goes away" after a few days...) Some pictures, like photos of devices, will be allowed, as long they are of small size (compressed *.gif or *.jpg) and are maybe just black-and-white.

New features on the current INE Website now include the use of new windows opening to show the requested links (which can also be done anywhere by using the right mouse-button when clicking on a URL link), all abstracts and a few papers from the October INE/EEMF Conference, and the new updated INE Device Database, if you know the required "password" (see the Nov. 2001 NEN for that).

SENATE BILL S.1333, 107TH CONGRESS Renewable Energy and Energy Efficiency Investment Act of 2001

Submitted by Patrick Bailey (via an email from Tom Valone)

Reference: <http://thomas.loc.gov/cgi-bin/query>

This bill was introduced on August 8, 2001 and referred to the Subcommittee on Energy. It is sponsored by Sen. Jeffords, Sen. Lieberman, Sen. Snowe, Sen. Schumer and Sen. Kerry. The following is a recap of the bills key features:
Key Findings:

- (5) the dependence of the United States on foreign sources of fossil fuels is contrary to our national security;
- (6) alternative, sustainable energy sources must be pursued;
- (7) consumers have a right to certain information in order to make objective choices on their electric service providers; and
- (8) net metering of small systems for self-generation of electricity is in the public interest in order to encourage private investment in renewable energy resources, stimulate economic growth, and enhance the continued diversification of the energy resources used in the United States.

National Electric System Benefits Fund:

Establishes a fund by imposing a "wires charge" of 2 mills per kilowatt-hour on all electricity generated in or serving the United States for interstate commerce. The Fund constitutes "electric system revenues" and not funds of the United States nor can it be used for any obligations of the United States. It is administered by an eight person Benefits Board with an appointed Manager.

Use of Fund:

Amounts in the Fund shall be used by the Board to provide matching funds to States for the support of State system benefit programs relating to:

- (A) renewable energy sources;
- (B) assisting low-income households in meeting home energy needs;
- (C) energy conservation and efficiency; or
- (D) research and development in areas described in (A) through (C).

Distribution:

- Up to 50 percent of State system benefit programs.
- A State may apply funds to system benefit programs in addition to the amount of funds applied for the purpose of matching the Fund share.
- To the extent that the amount of matching funds requested by States exceeds the maximum projected revenues of the Fund, the matching funds distributed to the States shall be reduced by an amount that is proportionate to each State's annual consumption of electricity compared to the aggregate annual consumption of electricity in the United States.

Renewable Energy Generation Standards. Requires retail electric suppliers to generate a minimum percentage of their energy from renewable resources, phased in from 2.5% in 2002 to 20% in 2020.

Encourages States to establish additional renewable energy generation programs (which can constitute matching funds cited above), but limits benefits of any such program to renewable generators within the State.

Renewable Energy Credits. One credit is issued for each kilowatt-hour generated through the use of renewable resources in any State. Credits are purchased for a fee equal to the amortized cost of the program administration or 5% of the national average market value of such energy credits. Credits can be bought and sold by retail electric suppliers to meet their minimum renewable energy standards. Thus, if one energy supplier generates a higher than required percentage of renewable energy, they can purchase and resell credits to any other entity (that needs them to meet minimum standards). The value of such credits will ultimately be established by the marketplace.

Penalties:

A retail electric supplier that fails to submit the required minimum number of renewable energy credits (each year) shall be subject to a civil penalty of not more than 3 times the estimated national average market value of that quantity of renewable energy credits for the calendar year concerned. The Secretary may bring an action in United States district court to impose a civil penalty on a retail electric supplier that fails to comply.

Net Metering. Requires that retail electric suppliers to provide net metering capabilities to customers who may generate a surplus of energy that:

- (a) is of not more than 100 kilowatts capacity;
- (b) is interconnected and operates in parallel with the transmission and distribution system of an electric company;
- (c) is intended primarily to offset some or all of the electricity requirements of a customer generator;
- (d) is located on the premises of a customer-generator; and employs a renewable energy source.

An electric company (A) shall charge a customer-generator rates and charges that are identical to those that would be charged other retail electric customers of the electric company in the same rate class; and (B) shall not charge a customer-generator any additional standby, capacity, interconnection, or other rate or charge.

The customer-generator must be credited for the excess kilowatt-hours generated during the billing period, with the kilowatt-hour credit appearing on the bill for the following billing period. Any unused kilowatt-hour credits accumulated by a customer-generator during the previous calendar year expire without compensation to the customer-generator. [Thus, a customer-generator is not encouraged to produce more energy than they consume - an unfortunate provision of this bill that will tend to slow national renewable energy production capacity].

Comment:

In general, this is a very positive direction in encouraging renewable energy production and decrease dependency on foreign, non-renewable energy sources.

It also establishes the right of consumers to choose electric

Energy suppliers (including themselves) and for net metering of customer-generated electricity. These are important provisions in encouraging:

- (1) existing energy suppliers to invest in renewable resources for energy production and
- (2) encouraging distributed production of energy by smaller consumers to meet their own energy requirements.

Citizens are encouraged to contact their own Senators and members of the Senate Subcommittee on Energy regarding this Bill. Also, contact your State representatives and Governor regarding the establishment of a complementary State Renewable Energy Program.

Full text of S.1333 is located at:

<http://thomas.loc.gov/cgi-bin/query>

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Jurisdiction of the Subcommittee includes oversight and legislative responsibilities for: nuclear, coal and synthetic fuels research and development; nuclear and non-nuclear energy commercialization projects; nuclear fuel cycle policy; DOE National Laboratories; global climate change; new technologies research and development; nuclear facilities siting and insurance program; commercialization of new technologies including, solar energy systems; Federal energy conservation programs; energy information; liquefied natural gas projects; oil and natural gas regulation; refinery policy; coal conversion; utility policy; and oil, gas and coal production and distribution.

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ARTICLES

INVENTORS OF INTEREST (FROM SILICON VALLEY)

Submitted by Patrick Bailey

After many conversations with important and wealth businessmen in the Silicon Valley (San Jose, CA) area, the following inventors seem to be the most talked about these days. If you are familiar with the work of any of these inventors, please write up a nice one-page or less summary of what you know and websites for references, and email that to me, and I will see that it is published in the next New Energy News. (Your name can be withheld if you do not want to be identified.) These are the front-runners of interest from these discussions: Spence, the Pantone engine, and the Carrick process.

UPS FIELD TESTS HYBRID ENERGY VEHICLE

Submitted by Patrick Bailey (from NHNE News, NHNE.com)

Reference: Reuters / Planet Ark, November 12, 2001
<http://www.planetark.org/dailynewsstory.cfm/newsid/>

ATLANTA - United Parcel Service, which has a fleet of 70,000 vehicles, is field testing a hybrid truck that uses a combination of diesel fuel and batteries, a company spokeswoman said last week.

"This is an example of trying to do something for the company and the environment," Paula Fulford, a UPS spokeswoman in Atlanta, told Reuters in a telephone interview. "We started field testing this truck in Huntsville, Alabama, October 1 and that will continue through February."

The test vehicle runs on a combination of a small diesel engine, which powers

the batteries that operate the engine, Fulford said. "The engine is a generator to power the batteries."

This way the UPS test truck uses less fuel and has lower emissions, Fulford said. Also, the driver can switch off the engine and just use battery power to run the vehicle.

DEVICES THAT CAN PUMP WATER

Submitted by Patrick Bailey

An interesting thing happened to me today (11/28) while driving: I was guided to become stuck behind a bus with a sign on the back that said (that): California uses over half of all its energy to pump water.

We all saw the wooden ramp device built by Tom Valone at the INE/EEMF Conference that allowed metal balls to roll up a 10-degree incline with input of energy. I wonder if such a device could be constructed for the lifting of water. Can it? Even if water could only be lifted a few feet vertically over hundreds of feet horizontally, then a switch-back system or a circular system could be devised to lift water to any height.

I am interested in any feasible devices that can lift water. Such devices would have immediate application, attention, and funding.

Here is one idea on a website: "THE GREAT PYRAMID IS A WATER PUMP!!; The Pharaoh's Pump Foundation --NEWSLETTER--"; at <http://www.thepump.org> .

BEHIND THE USA PATRIOT ACT

Submitted by Patrick Bailey (From the NHNE.com email list)

Reference: Ann Harrison AlterNet, November 5, 2001
<http://www.alternet.org/print.html?StoryID=11854>

NHNE Editor's note: This is the first in a series of two articles on the USA Patriot Act by Ann Harrison. The second will explore what is known about the identity and conditions of the 1,147 people detained in the anti-terrorism investigation.

... "The new law, known as the USA Patriot Act, reaches into every space that Americans once imagined was private. For instance, police can now obtain court orders to conduct so called "sneak and peak" searches of homes and offices. This allows them to break in, examine and remove or alter items without immediately, if ever, presenting owners with a warrant detailing what they were entitled to do

and where." ... [and emails...] ...

ENERGY BILL-WILL IT OR WON'T IT?

Submitted by Patrick Bailey (From e-EFFICIENCY NEWS)

As the days tick off and Thanksgiving approaches, it is still unclear whether the Senate will take up an energy bill this year. Republicans have turned up the pressure and vowed to try to attach an energy bill to whatever vehicle they can. Democrats, under the leadership of Majority Leader Tom Daschle (D-SD), continue methodically to assemble a bill. Sen. Frank Murkowski (R-AK) claims that Daschle doesn't want to bring up a bill because he would lose on the issue of drilling for oil in the Arctic National Wildlife Refuge. Daschle, whose bill is expected to include significant provisions to increase automobile fuel economy, as well as tax credits for energy-efficient technologies in turn, has taken the GOP to task for holding up appropriations bills and other important business that must be done before the Senate can get to energy.

Chair of the Senate Energy and Natural Resources Committee and Alliance Chair Senator Bingaman acknowledged the long odds against the passage of an energy bill this year to reporters covering the Alliance's Energy Efficiency Summit. But, with the Senate now expected to stay past Thanksgiving to resolve conflicts over appropriations, airport security, and the economic stimulus, nothing is certain.

Stay abreast of energy policy at: www.ase.org/policy
Reuters article on delay of energy legislation:

Washington Times article on GOP's plans to push energy legislation through congress: www.washingtontimes.com/national/20011108-720355.htm

Contact the Alliance Policy team:
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SMART METALS BEING USED BY US MILITARY?

Submitted by Patrick Bailey, from an email he received

Reference: <http://www.ufos-aliens.co.uk/morphingmetals.html>

We have uncovered evidence that proves that the US Military are using smart metals similar to those found at the Roswell Crash In 1947

"Time is ripe for the insertion of smart structures and materials into space systems."

Dr. Keith Denoger
Airforce Research Laboratories

"Imagine seeing a bullet shot through a sheet of material, only to have the material instantly "heal" behind the bullet! Remember that this is not science fiction. Self-healing materials actually exist, and LaRC scientists are working to unravel their secrets.

What we did at NASA-Langley was basically dissect that material to answer the question, 'how does it do that?'" McGowan said. "By doing so, we can actually get down to computational modeling of these materials at the molecular level. Once we understand the material's behavior at that level, then we can create designer 'smart' materials,"

Anna McGowan, program manager for the Morphing Project at NASA's Langley Research Center.

Does the above quote sound familiar? Metal that is cut, only to 'heal' itself? We have all become accustomed to hearing about technological advances that were initially spearheaded by secret military research projects. The Atom Bomb was developed during the Second World War amid incredibly tight security, and the first most people knew about Stealth technology was when the bat-like fighter-bombers were being rolled out of the hangers to attack the military apparatus of Iraq. Many of us are expecting a new dawn of technological wizardry to make its debut appearance during the current 'war on terrorism'. [More...]

DUTCH WIN SOLAR CAR RACE

Reference: BBC, Wednesday, 21 November 2001
http://news.bbc.co.uk/1/hi/english/sci/tech/newsid_1668000/1668180.stm

Submitted by Patrick Bailey

The Dutch Nuna car has won the World Solar Challenge in Australia.

The solar-powered vehicle crossed the timed finish line on Highway 1 on the northern outskirts of Adelaide at 17:09 and 20 seconds (local time).

It was comfortably ahead of its closest rival, the Australian entry Aurora, which will not make it to the same point until Thursday morning. [more...]

SCIENTISTS FINDING FUNGI A VALUABLE ALLY IN HABITAT RESTORATION MUSHROOMS PROVE METTLE BREAKING DOWN PESTICIDE AND OIL CONTAMINATION

Submitted by Patrick Bailey

Reference: Leslie R. Guttman, San Francisco Chronicle, Sunday, November 25, 2001

<http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive>

An offhand experiment in decontamination by a curious mushroom expert has led to technology that environmental scientists say could make dramatic repairs to the torn fabric of the globe's ecosystems.

When E. coli contamination threatened Paul Stamets' inlet in Olympia, Wash., the mycologist -- on a lark -- laid down some mushroom beds upland to filter the water. A year later, the coliform count had nearly disappeared.

Those mushroom mats have evolved into promising technology called mycoremediation, in which fungi work as eco-warriors to rapidly break down waste. Stamets partnered with a group of scientists at Pacific Northwest National Labs (PNNL) to create the technology.

Environmentalists call mycoremediation an elegant dance with the natural world that is radical in its simplicity. [more...]

SAUDI OIL AND TERRORISTS

Submitted by Hal Fox

Reference: Susan Lee, "We Can Live Without Saudi Oil," WSJ 13 Nov 2001, Pg. A22

"She said she was our best friend while all the time she was embracing our enemies," is the beginning of this report. We all know that Saudi Arabia provides a good percentage of the oil that America consumes. Saudi Arabia produces about 7,500,000 barrels per day or about 10 percent of the world's oil and we buy about 1,200,000 barrels of Saudi oil. If that oil flow stopped, the world price would go up to an estimated \$45 to \$60 per barrel. That would about triple the cost of gasoline for the United States so that we would be paying about the same price for gasoline as Europeans have been paying for years. It is estimated that the high price of oil would increase the amount of oil provided to the market by about 2 to 3 million barrels a day in about five months time. The message is that we can get along without Saudi oil but it would be better if Saudi could get along without sharing some of its oil revenues with terrorist organizations. Our message is that the commercialization of some of the new energy devices will, in time, stabilize the price of oil and provide the U.S. (and

the world) with cheaper energy.

CLIMATE CHANGE

Submitted by Hal Fox

Reference: John J. Fialka, "Kyoto Treaty Moves Ahead Without U.S.," WSJ, 12 Nov 2001 page A4.

The world is concerned about the warming of the earth's climate and the changing weather patterns. The world's richest country and the world's biggest polluter is not a part of the agreement. Paula J. Dobriansky, an undersecretary of state was the U.S. representative. The U.S. position is to question whether the Kyoto treaty is sound policy (whatever that means). According to some studies, the world has the rest of this decade to make dramatic changes in the way be polluting our atmosphere or suffer worldwide catastrophic changes, which may dramatically reduce the earth's population. A contribution to the understanding of the magnitude of the problem is made in the following article: Hal Fox and S-X Jin, "The World's New-Energy Market," *J. of New Energy*, vol 4, no 4, Spring 2000, 1 fig, 2 tables.

This article shows that it will take an estimated ten years to penetrate the current \$4.5 trillion per year fossil fuel market by ten percent with the development and commercialization of new-energy devices. In addition, it is estimated by Fox and Jin that the funding needed for plant and equipment to achieve this production of new-energy devices would be over 400 billion dollars.

ENERGY FOR POLLUTED WATER

Submitted by Hal Fox

Reference: Staff, "Dirty lakes put billion at risk, experts say," Deseret News, 12 Nov 2001, pg. A2.

Nearly one billion people are a risk because of overuse and pollution. More than half of the world's lakes and reservoirs has been harmed. The total of these bodies of fresh water represents 90 percent of all fresh water on earth. The good news is that much of this problem requires energy and the new-energy devices being commercialized may help to clean up some of these polluted waters. In addition, recent work being accomplished by EEMF, Inc. in Salt Lake City, Utah shows capability of precipitating many of the water pollutants by the use of special electrolysis techniques. The further funding of this work is being established through TransEra Development, LLC.

TERRORISTS THRIVE WITH ECONOMIC REPRESSION

Submitted by Hal Fox

Reference: Gerald P. O'Driscoll, Jr., Kim R. Holmes, and Mary Anastasia O'Grady, "Economic Repression Breeds Terrorism," WSJ, 12 Nov 2001, page A22.

The article provides an Index table of Economic Freedom. The most free states are 1. Hong Kong, 2. Singapore, 3. New Zealand, and a tie for fourth place with the following countries: Estonia, Iceland, Luxembourg, Netherlands, United States. At number 155, the last on the list are Iraq and North Korea. Insufficient data did not allow the ranking of Afghanistan, Sudan, the Democratic Republic of Congo, Angola, and Somalia. The overall headings range Free, Mostly Free, Mostly Unfree, and Repressed.

It is interesting to note that some of the world's oil wealthy countries are not very high on the list. Saudi Arabia is 72; Kuwait at 53; and Russia at 131. The message is that energy wealth does not ensure economic freedom. However, it is suggested that the commercialization of new-energy devices will improve the economic freedom of many countries and improve the living conditions.

WEIGAND WIRES - FREE ENERGY PULSE GENERATORS

Submitted by Tom Valone

Since you may not have heard about Weigand wires, I thought you would enjoy this excerpt from the paper from Tom Bearden's presentation to USPA this year. "On the Principles of Permissible Overunity EM Power Systems." He summarizes its properties pretty well.

"Many magnetic materials are also photorefractive, and readily produce nonlinear optical effects at various frequencies. As one example, multivalued phase conjugate reflection can occur. Such effects did occur in the Sweet vacuum triode amplifier. If the magnetics researcher doesn't know what a Wiegand wire [10] is or the Dromgoole effect is, or what the exchange force is, he needs to read the literature. The Wiegand effect occurs in a magnetic pulse wire which, in a magnetic field of a certain size, will self-reverse its dual magnetic state and deliver a very sharp, free magnetic pulse. By surrounding the wire with a coil of many fine turns, one can get a 12-volt pulse of electrical energy, for free. These assemblies are widely used as sensors and switching initiators."

10. "Wiegand effect: A new pulse-generating option," Automotive Engineering, 86(2), Feb. 1978, p. 44-48; SAE paper 780208, "The Wiegand Effect and its Automotive Applications," by J. David Marks and Michael J. Sinko, The Echlin Manufacturing Co.; "The Wiegand Effect. Some Properties of Wiegand Wire under Asymmetric Sine Wave Drive," by R.C. Barker and J.H. Liaw, Dept. of Engineering and Applied Science, Yale University; D. Botnick, "Access control systems offer programming flexibility," Bank Systems and Equipment, 21(8),

Aug. 1984, p. 66-68; J. Buj, "The 'Wiegand effect' enables various devices to be operated with the minimum of electric power," Revista Espanola de Electronica (Spain), 24(267), Feb. 1977, p. 14-17; Phillip E. Wigen, "Wiegand Wire: New Material for Magnetic-Based Devices," Electronics, July 10, 1975, p. 100-105.; Gerald M. Walker, "Wiegand's Wonderful Wires," Popular Science, May 1979, p. 102-104, 109; B. Dance, "The Wiegand effect - its applications," Electron (UK), No. 139, June 5, 1978, p. 23-24; H.J. Gevatter and W.A. Merl, "The Wiegand wire-a new magnetic sensor," Regelungstechnische Praxis (Germany), 22(3), Mar. 1980, p. 81-85 [In German]. See also Guenter H. Kuers, "Wiegand effect in theory and practice," Proceedings of SPIE, vol. 392, Proceedings of the 2nd International Conference on Robot Vision and Sensory Controls, Stuttgart, West Germany, Nov. 2-4, 1982, p. 123-132.

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PROPULSION STUDY FUNDING

Submitted by Tom Valone

Thanks to Paul LaViolette, this DARPA solicitation is presented below. Note that "teaming" is encouraged. The only problem is that anything we describe in detail and propose to build will be used to make bombs, as indicated below.

Propose Information Pamphlet for BAA 99-22

Small Scale and Novel Propulsion Systems Studies and Development for Small Aerospace Vehicles

This pamphlet provides information on the overall objectives of this Broad Agency Announcement (BAA). The first objective of the BAA is to solicit proposals and white papers for Topic A that develop small scale propulsion systems as part of the Small Scale Propulsion System Program. The pamphlet describes the DARPA Small Scale Propulsion Systems (SSPS) Program, its objectives, scope, program and structure. The second objective of the BAA is to solicit white papers on Topic B, the development of small, novel, highly dense propulsion systems for spacecraft power, energy storage, and propulsion. This document is provided to all offerors for information purposes only, and is not to be interpreted as government specifications or requirements.

The pamphlet provides information on proposal format and content and provides answers to anticipated questions about the BAA for those who wish to submit a proposal to participate in FY 99 funding of Topic A. A white paper may be

submitted under this BAA for Topic A. The white paper authors may receive future invitation to write a full proposal for a propulsion system development in the SSPS program. For Topic B, it is desired that only white papers be submitted and no formal proposals.

The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. These announcements will have appeared first in the Commerce Business Daily, published by the U.S. Government, Department of Commerce. The following additional information is for those desiring to respond to BAA 99-22, SMALL SCALE AND NOVEL PROPULSION SYSTEMS STUDIES AND DEVELOPMENT FOR SMALL AEROSPACE VEHICLES.

1. SSPS Program Vision and Goals

A trend is evolving in the military that places a heavier reliance on unmanned systems for sensing and weapons. The current systems are large, with large signatures and large logistics footprints. The general direction of technology development is to make systems smaller. The commercial world is pushing the communications, processors and sensor systems smaller. A limiting factor to reduce the size of aerospace vehicles is that the currently available military rated propulsion systems are large. The Small Scale Propulsion Systems program was created to address this issue, to miniaturize aerospace vehicle propulsion systems. The Small-Scale Propulsion Systems program goals are to develop and demonstrate several small aerospace vehicle propulsion systems. These propulsion systems will enable the development of new classes of small-scale weapons and aerospace vehicles to exploit sensor and information technologies to increase situational awareness. Additionally, these propulsion systems will enable precision weapons with higher probabilities of kill with reduced cost and logistics burden. This BAA is directed to the development of engines and supporting technologies that fill the propulsion system void for flight vehicles between the sizes of Micro Air Vehicles (MAVs) and the Miniature Air Launched Decoy (MALD).

There are many different vehicle classes and military missions that can be enabled by decreasing propulsion system size. Three examples of small aerospace vehicles have been identified as high payoff vehicles. They include: long endurance hovering vehicles, long range cruise vehicles, and, small rockets that can deliver payloads of half a kilogram to low earth orbit altitudes. What follows are descriptions of these high payoff aerospace vehicles to give the prospective Topic A BAA respondent a basis of nominal flight vehicle system and hence propulsion system performance characteristics. They are by no means system requirements specifications for current or future military systems. Also, the Small-Scale Propulsion Systems program is not limited to these system concepts.

A small long endurance hover or low speed cruise vehicle has the ability to support many possible military applications. These applications include a vehicle platform to provide: an RF communications node and network router, a surveillance sensor, and navigation beacon. Given the miniaturization of electronic components, it is feasible for the payload of such a vehicle to weigh

less than 1.5 kg. Current technology hover vehicles are heavy (in excess of 100 kg) with short endurance (less than 3 hours). With a small efficient propulsion system and lightweight payloads, it is possible to design a platform with significantly longer endurance and lighter weight.

The long-range small cruise vehicle is another aerospace vehicle for future military applications. With the emergence of lightweight precision guidance and seekers systems, it will be possible to reduce munitions payload on standoff weapons and cruise missiles. Furthermore, concepts are emerging for loitering capability with smaller current inventory military munitions like the Brilliant AntiTank (BAT) munitions or future concepts like LOCAAS. Also there are concepts of small electronic warfare air platforms like MALD, only smaller. These flight vehicles will be air launched (with the requisite starting problems), fly nap of the earth to 6-km altitudes and weigh less than 40 kg. Flight speeds of these vehicles may vary from $M = 0.2$ to supersonic and the vehicles may have endurance greater than 20 minutes.

Finally, small satellites are an emerging military space vehicle concept. It is desired to reduce the cost of sending satellites to orbit by reducing satellite and launcher size and weight. Therefore, it is desired to make rocket engines for launchers that weigh less than 15 kg and accurately insert payloads to 0.3 kg in low earth orbit. This is achievable with high altitude air launches and multiple staged rockets.

2.0 Novel Space Propulsion and Power Systems

Many new small (100 kg and lower) satellite concepts are limited by current technology propulsion, power, and energy storage. Generally, satellites are electrically powered by solar panel arrays and propulsively powered by chemical rockets. As a satellite is eclipsed by the earth, electrical power must be drawn from an electrical energy storage system. Batteries are usually the storage mechanism, but they are heavy and become even heavier when limits are placed on the allowable depth of discharge in order to achieve long battery endurance. This has a great impact on electrical power system design and the power system weight budget for low earth orbit satellites. Moreover, chemical rockets for propulsion power have low specific impulse and impact the life of a satellite when rockets must be employed for maneuver or momentum dumping.

Therefore, DARPA is soliciting white papers to propose new and novel space power and propulsion systems with high energy and power density. DARPA is interested in new and novel approaches to spacecraft power and propulsion systems, with an emphasis on power, performance, efficiency, and multifunctionality. Scalability to general use is also desirable.

3.0 Proposal Format Requirements

For Topic A, small scale propulsion system developments, the offerors may submit a full proposal for evaluation in the first round of program FY99 funding. Or, the offeror may write a 10 page white paper for further consideration and future invitation to submit a full proposal. For Topic B, novel power systems, only a white paper is needed at this time to explain the proposed concept.

3.1 White Paper Format

White papers have an informal format, but should follow the following guidelines. White papers should include a cover sheet with BAA number, authoring organization, white paper point of contact information, and white paper title. The cover sheet does not count as part of the 10 pages. The white paper should include an abstract followed by the paper describing the concept, the scientific merit, relevance and utility. The pages should be single-spaced on paper not greater than 8.5 by 11 inches, typed, single sided, and have 1-inch margins on top, bottom and both sides.

2. Proposal Format

All proposals must be in the following format. Non-conforming proposals may be rejected without review. All proprietary material should be clearly marked and will be held in strict confidence. The following shall be included within the technical and management (Volume 1) and cost (Volume 2) of the proposal:

PAGE FORMAT:

All pages shall be single-spaced on paper not greater than 8.5 by 11 inches in size and typed single-sided with 1.0-inch minimum top, bottom, and side margins. The font size must not be smaller than 12 point;

COVER SHEET:

The cover sheet should include the following information: BAA number; lead organization submitting proposal, team members, proposal title, proposal point of contact (salutation, first and last name, mailing address, city, state, zip code, telephone, fax, and e-mail), total cost to the Government, and total duration in months.

OFFICIAL TRANSMITTAL LETTER:

The official transmittal letter for the proposal should be printed on corporate stationery and signed by the responsible corporate official.

TECHNICAL MANAGEMENT PROPOSAL:

Volume 1 is limited to a maximum of 30 pages including all charts, figures, and appendices. Fold-out pages count as two pages. Volume I shall include:

A. Table of Contents

B. Executive Summary

This section provides an overview of the proposed technical approach, benefits, and cost.

C. Scientific Merit and Technical Approach

The technical approach should be described, including the plan for design, fabrication and evaluation of the proposed Small-Scale Propulsion System technology and all supporting subcomponents included in the system. The proposed approach should be discussed in the context of its advantages over alternative or available technology solutions. Additionally, an estimation based on analysis and/or experimental data of the expected thrust, power performance, and endurance of the proposed approach should be made over the flight envelope of altitude and speed for the proposed propulsion system application and/or mission. Proposals should describe critical technical issues and associated tasks to be performed, and delineate the major technical risks expected along with steps for mitigation of these risks. The proposal should also describe in the technical development plan, any proposed system or component demonstrations and the proposed final flight demonstration vehicle.

D. Relevance and Potential Utility

This section should delineate the specific potential applications of the proposed propulsion concepts. Potential mission capabilities and concepts of operation should be described. Mission cost can be a mission enabler if the small vehicle can perform a mission at a fraction of conventional current system cost.

E. Expertise and Experience

Proposals should give a complete elaboration on the capabilities of the proposer(s), including a description of the role of all team members (if applicable), and evidence that the proposers have the appropriate expertise and facilities for the critical technology issues being addressed.

F Management (Within the context of the procurement instrument that the off error recommends (contract, grant, etc.), this section should describe (i) the structure and methods by which the off error intends to accomplish the requirements of the SSPS Program and ensure quality control, and (ii) innovations and creativity relative to the treatment of such matters as termination provisions, the use of Independent Research & Development (IR&D) moneys, rights in patents, rights in data and computer software, property disposition,) and (iii) concepts and plans for transitioning the propulsion technology.

COST PROPOSAL

Volume 2 of the submitted proposal shall contain a complete cost breakdown. The cost proposal shall be prepared in general accordance with FAR 15.804-6 and shall include a Standard Form 1411, Contract Pricing Proposal Cover Sheet, with all supporting data in order to allow for a complete review by the Government. The breakdown of cost data shall include all costs expected to be incurred under the contract. Cost details, broken-down by cost element, should be prepared for each task of the WBS along with supporting rationale in sufficient detail to substantiate the cost estimates. A budget summary, by technical/development task must be provided. Proposed efforts shall be coasted for a base 6-month initial funding period with additional priced options (not to exceed three options of up to 12 months each) for additional research,

development and demonstration. The cost proposal shall include all supporting documentation including, but not limited to: breakdown of labor hours by category, materials (vendor quotes or method of establishing cost), travel, direct, and indirect costs. Prime contractors are responsible for assuring that an executed SF 1411 supports all proposed subcontracts in excess of \$500,000. There is no page limit on the Cost Proposal.

4.0 Answers to Anticipated Questions

Q: Will DARPA provide written debriefs concerning the results of proposal evaluation or funding decisions?

A: No.

Q: How firm are the page limits?

A: Firm. Proposals and white papers exceeding the page counts may not be reviewed.

Q: Can one institution bid more than one proposal?

A: Yes, but the submissions must be separate.

Q: How important is teaming?

A: DARPA encourages teaming where combining forces leads to the most effective approach and is in the strategic interest of the parties involved. But teaming is not essential.

Q: How many awards are expected?

A: Approximately on the order of 4 to 6 with possible down-selection at the end of Phase I. The exact number will depend heavily on the number and quality of the proposals.

Q: Will DARPA make awards in all three application areas (Long endurance hover, long endurance cruise, and rocket engine?).

A: Not necessarily, it depends on the number and quality of proposals. Also, the applications areas can go beyond the examples provided here in the PIP provided the perceived system payoffs are good.

Q: To whom should additional questions be addressed?

A: As stated in the BAA, DARPA will not entertain questions on this BAA.

TWO ARTICLES FROM NATURE MAGAZINE

Submitted by Tom Valone

NATURE magazine Vol. 414 (11/15/01) has two articles (summarized below) that propose to look for energy solutions:

* The first is a materials review article that even uses the word "urgently" to describe the importance of the search.

* The second article from DOE & MIT wants to know what is technologically possible.

Perhaps IRI Future Energy has a chance to get their attention, only if the industrial lobby article attached (also from Nature) is taken into account. Called "Shooting the Messenger," the attachment shows that the facts about global warming are routinely being distorted by government and industry.

MATERIALS FOR CLEAN ENERGY

Submitted by Tom Valone

NATURE magazine, Vol. 414, No. 6861 (15 November 2001).

Increasing awareness of environmental factors and limited energy resources have led to a profound evolution in the way we view the generation and supply of energy. Although fossil and nuclear sources will remain the most important energy provider for many more years, flexible technological solutions that involve alternative means of energy supply and storage need to be developed urgently.

The search for cleaner, cheaper, smaller and more efficient energy technologies has been driven by recent developments in materials science and engineering. The aim of this collection of reviews is therefore to focus on what materials-based solutions can offer and to show how the rational design and improvement of chemical and physical properties of these materials can lead to energy alternatives that can compete with existing technologies.

ALTERNATIVE ENERGY TECHNOLOGIES

Submitted by Tom Valone

NATURE 414, 332 - 337 (2001) (c) Macmillan Publishers Ltd.
M. S. DRESSELHAUS* AND I. L. THOMAS?

* Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139, USA Office of Basic Energy Sciences, U.S. Department of Energy, 19901 Germantown Road, Germantown, Maryland 20874-1290, USA

Fossil fuels currently supply most of the world's energy needs, and however unacceptable their long-term consequences, the supplies are likely to remain adequate for the next few generations. Scientists and policy makers must make use of this period of grace to assess alternative sources of energy and determine what is scientifically possible, environmentally acceptable and technologically promising.

The FULL TEXT of both articles available at:

<http://www.nature.com/cgiataf/DynaPage.taf?file=/nature/journal/v414/>

BOOK REVIEW

Dohn Riley and Mark McLaughlin, Turning the Corner: Energy Solutions For the 21st Century, Alternative Energy Institute, Inc., c2001, 385 pages, illus., indexed, \$24.95.

Book Review by Hal Fox

The authors do an excellent job in reviewing, chapter by chapter, with a section on fossil fuels and another section on all of the alternative energy developments. They are honest in their report and provide both history, costs, advantages, and disadvantages of energy from sun, wind, fuel cells, hydropower, geothermal, biomass, ocean tides, ocean waves and ocean thermal differences. The first two sections occupy the first 173 pages of the book and provide an excellent review with many sources quoted, especially Internet sources. At this point the reader is well aware that the burning of fossil fuels are polluting our world and that some alleviation of pollution has been achieved. The message is that the alternative energy sources have been developed, are increasing in use, are becoming less expensive, but will not replace all of the burning of fossil fuels. The authors should be commended for properly reporting the problems with the use of hydrogen fuel cells -- that it takes a lot of energy to make the hydrogen and the overall efficiency is much less than 100 percent. These two sections are the best that this reviewer has seen in detailing the burning of fossil fuels and the development of alternative energy sources.

Section III reports on possible and potential technologies that may provide the much needed energy revolution. The authors do a fair and readable report on cold fusion. The authors treat cold fusion as having some commercial potential. They could have been a bit more precise in their report on cold fusion, such as the following:

1. Pons and Fleischmann did not call the press conference (it was the U/Utah Administration).
2. Prof. John Bockris replicated the Pons-Fleischmann experimental results in less than six weeks.
3. Several of the DOE National Laboratories replicated the Pons- Fleischmann effect.
4. Over 600 papers from over 200 laboratories in 30 countries have reported on replication or extension of the Pons-Fleischmann experiment.

5. Many patents have been issued in many countries (over 200 in Japan). Only a few patents have issued in the U.S. If cold fusion is mentioned, the patent application is denied by the U.S. Office of Patents and Trademarks.
6. The famous MIT experiment signed off by 16 Ph.Ds. (none of whom were experienced electrochemists) actually got excess heat. One or more of the authors changed the data to show negative results.
7. There was a dedicated, well-funded, and largely successful effort by supporters of hot fusion to destroy cold fusion in the U.S.

This reviewer would suggest that the following be added to this book: The most important facts about cold fusion is that it works; is difficult to replicate repeatedly; is highly dependent on the methods used to process the palladium cathodes; and has not yet been shown to have high commercial source of energy.

The authors tackle the topic of Zero-Point Energy (ZPE) and report that many of today's academic scientists do not recognize that there is an enormous source of energy, or if there is a big energy source they doubt that it can be tapped for commercial use. The authors cite the ZPE-tapping discovery of Ken Shoulders and also cite the similar discovery by Mesyats of Russia. However, the similar independent discoveries by the late Stan Gleeson of Cincinnati and that of Dr. Alexander Ilyanok are not cited. It is an important fact that this new technology has been independently discovered by four groups in three countries and that they made similar discoveries as to size and applications of the high-density, electron charge clusters (HDCC). This reviewer believes that the discovery of HDCC is the most important new-energy discovery of the 20th Century. The authors have properly cited the work by Shoulders and Mesyats.

The authors report Dr. Paul Brown's work with the amelioration of radioactive wastes but apparently were unaware of the work done by Stan Gleeson (assisted with about 3 years of similar work by Jin and Fox) in demonstrating the reduction of the radioactivity in high-level radioactive liquid wastes.

The authors report Dr. Randell Mills' new-energy discovery of the suggested collapse of the hydrogen atom and the excellent funding obtained and projects that are progressing under Dr. Mills' direction. The authors should be commended for not reporting on the large variety of claims about magnetic rotating machines as none of these rotating machines have shown strong commercial potential. Some good reporting is accomplished about California's requirement for zero-emission vehicles and how some of the Electric Vehicles could fill this requirement. They leave it to the reader to recognize that one or more of the new-energy devices may be commercialized as an on-vehicle battery charger.

This book is an excellent source book for its report on all the fossil fuels together with geographical sources of supply and of the various national users of fossil fuels. The reports on alternative energy devices is complete, and is an excellent source to remind us of both the advantages and problems with alternative energy sources. The wind doesn't always blow, the sun doesn't always shine, strong tides occur only in selected places, the geothermal sources are sparse, and it would take a lot of acreage of biomass to produce sufficient fuel to run a fraction

of our automobiles. We would expect that the Alternative Energy Institute, Inc. would be well versed on alternative energy, and they are.

Hopefully, these authors will be soon be able to report that the academic community of scientists are saying, "I knew it would work." or even, "That's my idea that is being marketed."

The book is the best yet published, in this reviewer's judgment, on fossil fuel use and alternative energy. A good start is made on reporting on the latest new-energy developments. We recommend this book for your library.

This book is priced at \$24.95 and can be ordered from information provided at www.altenergy.org., or can be ordered through the Institute of New Energy office email: halfox@qwest.net

LETTERS

Ultracapacitors: "100 times the energy of conventional capacitors and 10 times the power of ordinary batteries".

From David Rosignoli

Hal & Patrick,

The latest issue of Poptronics magazine (December 2001) has a description of ultracapacitors on pages 12-14 that might be worth your interest. Apparently, by using a carbon-based electrode material, these capacitors have "100 times the energy of conventional capacitors and 10 times the power of ordinary batteries". These capacitors can cycle (recharge and discharge) 100's of thousands of times. Maxwell Technologies sells some versions of these caps. with a capacitance of 2700 Farads with the ability to deliver 625A at 2.7Volts. Apparently, some company is using them in hybrid electric cars. Compared to equivalent battery packs, the ultracapacitor storage device has 1/3 the weight and occupies 1/2 the volume.

So, perhaps the day of replacing storage batteries with ultracapacitors is upon us.

-David Rosignoli drdaveor@enter.net

Very Advanced Betavoltaic Technology

From: Michael McDonnough <mkm@teksphere.com>
Sent: Friday, October 26, 2001 12:01 AM

I was researching your site and wanted to see if you have heard about the very novel ideas we have been discovering concerning betavoltaic technology. Our

company is working with Quantum Bit Induction Technologies Inc., at <http://www.quantumbit.com> to develop a new and very high energy density betavoltaic power system. Our energy systems will be roughly 6 times the energy density of Dr. Brown's Tritium based power system with Astro Power Inc. If you are interested in discussing this technology please contact me by email to arrange a phone interview. My company is going to be using www.betavoltaic.com and www.betavoltaic.net for this project and we are expecting to be online later next week with the new site.

Michael McDonnough
Co-CEO/COO
TekSphere International Inc.

HAPPY HOLIDAYS, MEANINGS, AND PRIORITIES

From: Patrick Bailey

I wish the very best to each and all of you during this coming Holiday Season, and I encourage you to seriously reflect on the events of these past two years. Be involved. Be active. Remember the meanings of these holidays for you and your families. List and keep your priorities. Money and greed are pretty far down on my priority list - way after health, family, friends, and religious beliefs. May the real "Light of Truth" touch us all and make this world a much better place for everyone. And, whatever your religious faith: Have a Happy and Merry Christmas, Hanukkah, Kyanzaa, Ramadan, Winter Solstice, and Blessings Be!

MEETINGS

International Convention Center, Tsinghua University, Beijing, CHINA

May 19-24, 2002

Scope of the Conference

The "9th International Conference on Cold Fusion", ICCF9, will take place in Beijing, China, in the week 19- 24 of May 2002. The study of Cold Fusion (CF) phenomena sometimes referred to as "New Hydrogen Energy" (NHE) is progressing in numerous laboratories all around the World. More than 10 years old, the field is enjoying ever more reproducible experiments and a better interactions with the scientific community. A large variety of experimental approaches will be addressed in the Conference together with theoretical attempts to interpret the observed phenomena. The important sponsorships that have been secured for ICCF9 guarantee that the Conference will maintain the most rigorous scientific standards. As stated in Lerici, the theme of ICCF9 would be COHERENCE: Coherence between Nuclear Physics and Solid State Physics; Coherence between Cold Fusion and Hot Fusion; Coherence between Research

and Development. We are glad to see the progress in all three aspects in the past years.

Dear Friends and Colleagues,

I have received warm reply after I sent the fourth announcement. I have to supply the Website for ICCF-9 as: <http://iccf9.global.tsinghua.edu.cn> because a lot of friends need this information again for registration. Besides, if you need any paper work to support your visa procedure please let me know your need.

Sincerely: Xing Zhong Li,
Nov.26, 2001
iccf9@tsinghua.edu.cn

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Last ten years of New Energy News, 1996-1999 of Journal of New Energy, Fusion Facts, Cold Fusion Source Book - Regularly \$49.00, offered to JNE subscribers and INE members for \$35.00 plus \$4.00 shipping and handling.

E-mail: halffox@qwest.net

Alliance to Save Energy: An Energy and Efficiency News Email List

Submitted by Patrick Bailey (via email from Tom Valone)

Alliance to Save Energy

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ENERGY RECYCLING CORP.

Submitted by Gerald Fisher

ENERGY RECYCLING CORP. has patented a technology that utilizes the return condensate steam used in manufacturing for heating the plant and offices and to air condition the same premises.

Contact Gerald Fisher at 212 535-5919 or 212 879-8537
Fax 212 439-6107 E Mail Fisher82@earthlink.net

<p><i>*Science & Technology* Medicine-Human Sciences*</i></p> <p>ARCANA BOOKS <i>948 East Millcreek Way</i> <i>Salt Lake City, UT.84106.USA</i> <i>Tel/fax: 801.474.1050</i> email.jkarcl@qwest.net <i>Web side: www.abebooks.com/home/lubov</i></p> <p><i>*Specialists in hard to find books of particular interest*</i> <i>Free Book Search*</i></p>
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