Reaching for the Stars with Recovery Act Funds

Joseph Bernstein

CHICAGO, IL - Joseph Bernstein wanted to be an astronomer for as long as he can remember. So, one can imagine his joy when he first joined Argonne as an engineering assistant in 2007. With Recovery Act funds, Bernstein along with ten other fellows have the opportunity to continue to further his expertise in his field. Bernstein has transitioned to a role as a computational postdoctoral fellow where he will use the laboratory's Blue Gene/P supercomputer attempt to uncover the origin of the universe.

"Argonne is unique in terms of the sheer diversity of projects people are working on and the types of science they are pursuing," he said. "The people here have a lot of technical expertise, which makes it an ideal place to pursue cutting-edge science. It's unrivaled in comparison to anywhere else I've ever been."

Bernstein earned a bachelor's degree from the University of Chicago, a masters' from the University of Kentucky and a Ph.D. from the University of Michigan. He turned down a university tenure track job to stay at Argonne.

Fastcap Systems

"Our mission is to transform the automotive and power grid industries in the United States to create jobs, curb harmful greenhouse gas emissions, and reduce carbon-based fuel consumption." - FastCap Systems

The staff at Fastcap Systems

CAMBRIDGE, MA - Dr. Riccardo Signorelli, a research scientist at FastCap Systems, received Recovery Act funds from ARPA-E to lead an innovative project that could dramatically reduce the cost of Hybrid Electric Vehicles (HEVs).

The main catalyst behind the research lies in the **ultracapacitor** – a super battery that can charge quickly, store large amounts of energy, and release large amounts of energy quickly.

Signorelli's group is focused on developing a novel energy storage technology that would combine all of the advantages of ultracapacitors and batteries without the disadvantages of either technology. Specifically, FastCap Systems intends to produce an ultracapacitor made of carbon **nanotubes** – extremely small high performance tubes of carbon that provide high energy density, high power, and extreme temperature reliability. In addition, the ultracapacitor will be safe from leaking and explosions.

If the project is successful and openly accepted into the U.S. markets alone, FastCap-enhanced HEVs could reduce annual fuel consumption by 80 million barrels of oil, save consumers $4 billion of spending on fuel, and eliminate 24M tons of CO_2 emissions.

Recovery Dollars at Work

LOS ALAMOS, NM - Pete Stilwell is leading northern New Mexico to a better economic recovery.

Pete Stilwell

The senior manager for ARSEC Environmental, LLC has coordinated the recruiting and hiring of 15 full time workers to help decontaminate and demolish outdated buildings at Los Alamos National Laboratory.

The Recovery Act is paying for the work, which both creates jobs and cleans up the environment for future generations. Stilwell said the Recovery Act is a big deal for his company, and the workers employed there.

"It's increased ARSEC Environmental's revenue stream 50 percent," Stilwell said. "As a small business we really appreciate it."

ARSEC's increased presence at the lab due to the Recovery Act-funded work has allowed them to be successful in other non-Recovery Act opportunities.

Stilwell's crew is working to remove hazardous materials such as asbestos from the old buildings before they are torn down. Many are from northern New Mexico. "And not one direct hire was employed before the recent cleanup job came along", he said. All had been laid off from other work. Stilwell's current crew totals 19, including the 15 laborers and four managers. He's hoping to hire another 10 heavy equipment operators and laborers as the project accelerates. A laborer's job pays about $17.25 an hour. When the overall project is finished, lab officials hope to reduce the footprint of the lab's buildings by more than 157,000 square feet. Eventually, the land will be available for other uses.

Altogether, Los Alamos National Laboratory has been awarded $212 million for cleanup, which includes the demolition work, removal of an old waste dump, and new wells to monitor groundwater for possible pollution. Several small businesses are involved in the jobs, from demolition to trucking.

"It's been a good thing," Stilwell said.

Finding Energy Upgrades in Unique Ways

NORTH LITTLE ROCK, AK - The $40 million of Recovery Acts funds used for weatherizing more than 6,500 homes over the next two years in Arkansas is a welcomed boost, but Martha Jane Murray of the Clinton Foundation is thinking bigger. "How do we create a more robust delivery system that is not just relying on federal dollars," asks Martha Jane, the program director for the foundation's Arkansas Clinton Climate Initiative (CCI AR). For CCI AR, one answer is the Home Energy Affordability Loan, or HEAL, program.

Energy-audit crew visits a L'Oréal employee's home in North Little Rock, Ark

In a unique approach to help chip away at the list of homes in need of weatherization and lower industrial energy consumption, CCI AR developed a loan program in which employees borrow money from employers for energy efficiency upgrades. The employers fund the loans using money saved through their own energy-efficiency projects.
The L'Oréal USA facility in North Little Rock, Ark., is the first location to test the program, which is being financed with a portion of the $2 million of Recovery Act funds awarded to CCI AR. The company is self financing lighting retrofits in exchange for offering 100 employees energy audits and subsequent loans to perform the upgrades.

"The goal is replication," Martha Jane says. "The CCI AR would like to implement this type of revolving loan program in companies all over Arkansas and the country."

Here's how it works: If a business qualifies to participate in the HEAL program, it receives a free commercial audit and access to a fixed amount of funds from the HEAL zero-interest loan fund for the retrofit. In return, the business agrees to provide zero interest loans for employees—either by putting the money upfront or using energy savings to fund the loans—so workers can improve energy efficiency in their homes. CCI AR provides one-stop coordination for these audits and upgrades for the employees. The employee then pays back the employer in payroll deductions with the money they have saved on their energy bills every month.

Small Businesses Harnessing Solar Energy with Building Materials

COLORADO SPRINGS, CO - Business partners Jeff Szczepanski and Rob Lyndall imagine a world where many of the buildings have walls, windows and other materials that are integrated with photovoltaic technology — that is, buildings that generate solar energy without necessarily adding panels to the roof. And because of new funding opportunities, that vision might not be too far into the future…

Read the full story

More Weatherized Homes for Minnesota Tribe

FOND DU LAC, MN - Randy and Dorothy Pittman are cozy now, but for the first few winters in their new home at the Fond du Lac Reservation this was not the case. At first, the couple, who moved from muggy Alabama, thought they needed time to acclimate to the Minnesota cold. It turned out it was the two-story house they constructed that needed adjusting…

Read the full story

Georgia Non-Profit Helps Homeowners Save Energy

SAVANNAH, GA - Not only is Mattie Williams' house more efficient, her monthly energy bill went down from $400 to $217, on average. "When they put in a brand-new, out-of-the-box heating system, I was so surprised," she says. "It all costs so much, and I couldn't afford it — it was just amazing"…

Read the full story

The Talahassee Smart Grid

TALLAHASSEE, FL - Tallahassee is the first city in the country to integrate Smart Grid technologies into its entire utility system, using an advanced metering infrastructure for electric, natural gas and water operations. With a Recovery Act grant of $8.9 million, the City of Tallahassee will build on that platform with smart thermostats and other sophisticated tools designed to preserve resources and promote energy and water efficiency.

"We are unique in our approach to the Smart Grid network," said City of Tallahassee Mayor John Marks. "By incorporating advanced information technology into every aspect of delivery and consumption, we reduce cost and environmental impact, improve service and increase efficiency."

Tallahassee Mayor John Marks observes the incoming data on the city's electrical use courtesy of Smart Grid technology

As a gateway to the Smart Grid, the City's new Energy Smart Plus (e+) initiative provides customers with programs, tools and innovations to help them save energy, water and money. The backbone of the system includes 220,000 electric, gas and water smart meters, a communications infrastructure, data collection software to manage power use, smart monitors (in-home displays), e+ Online (web based help tool) and other measures to enable customers to reduce electric demand and energy use. Tallahassee also plans to implement various rate structures to encourage customers to use appliances, such as washing machines and dryers, during less expensive, off-peak hours.

Tallahassee utility customers will use Smart Grid technology to control thermostats remotely and receive a text message or email alert when their usage approaches a preset limit. Customers will know their utility use and total cost of their service in real time. Smart Grid technology will permit the City to identify outages for faster repairs.

250,000 safe hours worked

PADUCAH, KY – Recovery Act workers at the Department of Energy's Paducah Site have logged more than 250,000 hours without a lost time accident. The milestone was reached in mid-April 2010.

More than 300 people are employed on three ARRA accelerated demolition projects at Paducah. Many of those workers were hired in the past year and most of them had experience working in non-nuclear industries. Their daily work activities at Paducah include tasks such as: asbestos abatement, removal of pipes containing hazardous material, and work in radiologically contaminated buildings. Much of the work is done while wearing full protective equipment, including respirators.

Workers begin to remove equipment from inside the C-340 Metals Plant

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