

Energy at Work

A Monthly Review of Recovery Programs Working for Kentuckians



KENTUCKY AT WORK Kentucky Energy & Environment Cabinet
Department for Energy Development and Independence

Center for Applied Energy Research breaks ground on battery research building



L-R: Senator Tom Jensen, UK President Lee Todd, Jr., CAER Executive Director Rodney Andrews, NIST Chief Facilities Management Officer Fiotes Stella, Governor Steve Beshear, Lexington Mayor Jim Newberry, KY Speaker of the House Greg Stumbo, CAER Board Member and House Majority Leader Rocky Adkins

On October 13th, the University of Kentucky's Center for Applied Energy Research (CAER) hosted Governor Steve Beshear, University of Kentucky President Lee Todd, Jr. and other state and local government officials to break ground on an energy research lab at Spindletop Research Park in Lexington.

The \$19.8 million renewable energy laboratory will allow CAER to greatly expand its research capabilities devoted to Kentucky's growing renewable energy industries, including biomass and biofuels, electro-

chemical power sources (such as capacitors and batteries for electric vehicles), and distributed solar energy technologies.

Architects, researchers and engineers were on site at the groundbreaking discussing and demonstrating what will go into making the 43,000 sq. foot building the state's first Leadership in Energy and Environmental Design (LEED) Gold laboratory building. The facility itself will be a living laboratory with interpretive displays and activities for school-age children, visitors, and the general public related to the building's energy consumption and the technologies and research that will be carried out in the facility.

The facility is being funded by a competitive grant CAER won last year from the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) under the American Reinvestment and Recovery Act's (ARRA) NIST Construction Grant Program. The award consisted of \$11.8 million in federal funds, with matching resources of \$3.5 million provided by the Commonwealth of Kentucky and \$1 million from UK. An additional award of \$3.5 million in state ARRA funds has also been provided by the Department for Energy Development and Independence to achieve LEED certification and insure this new laboratory is a model for energy efficiency and renewable energy technologies. The total amount for the project including these LEED enhancements equals \$19.8 million.

Kentucky governor Steve Beshear said, "Kentucky is poised for great things, and I strongly believe establishing a high-tech industry such as the Kentucky-Argonne Battery Manufacturing Research and Development Center will be the catalyst for strong economic growth as we begin to emerge from these difficult times."

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Energy Management workshops held for school energy managers

Kentucky Pollution Prevention Center, in partnership with the Kentucky School Boards Association (KSBA), hosted a series of energy management workshops in late September and early October, which provided training to school district energy managers, energy team members and other district stakeholders who wanted to learn how to establish a sustainable energy management program that yields cost savings year after year.

The workshops were designed to facilitate Kentucky school districts' participation in KEEPS – Kentucky Energy Efficiency Program for Schools – and the Kentucky School Energy Managers Project (SEMP). The workshops took place across the state from September 27th to October 1st.

Energy Managers attending the workshops received training and information about the seven-step framework of the KEEPS training system and the benefits of becoming an ENERGY STAR® Partner; tools and guidance that facilitate utility bill rate analysis and energy management reporting requirements pursuant to KRS 160.325; how to identify energy reduction and cost-saving opportunities

through energy efficiency assessments; how to raise awareness about district-wide energy efficiency initiatives through an effective communications plan; and a review of successful energy management programs from school districts throughout Kentucky.



Warren County Energy Manager Jay Wilson and KEEPS Regional Coordinator Kimberly Joseph at the Owensboro Workshop on October 1. Photo courtesy of Chris Wooten.

...Laboratory groundbreaking continued



Governor Steve Beshear

The new laboratory will also compliment and create important collaborations with the Kentucky-Argonne Battery Manufacturing Research and Development Center. An agreement is in place with the Commonwealth of Kentucky for the shared use and occupancy of the new laboratory between UK CAER and the Center, with portions of the laboratory purposely designed and specially equipped to accommodate capacitor and battery manufacturing research and development.

"The NIST funding will make a tremendous difference in the energy research capabilities of CAER," said Rodney Andrews, director of CAER. "It is allowing a major expansion of research space for the Center, which has been a critical need, and could not have come at a better time as our renewable energy and energy storage programs have continued to expand over the last couple of years."

Together, CAER's new laboratory and the Ky-Argonne Battery Center will help greatly increase the amount of federal and private research dollars coming to Kentucky and will lead to additional high-paying, high-tech jobs. The opportunities for collaboration between the Argonne facility and the university will provide an economic engine that will benefit Kentuckians across the region.

"This new facility will provide our world-class researchers with the leading-edge tools they need to push the edge of energy research," said UK President Lee T. Todd Jr. "UK is Kentucky's leader in energy research, and this new building will allow us to discover new knowledge and breakthroughs that will have long and lasting impacts on Kentucky, the nation, and the world."

Finding energy efficiency and savings on a Kentucky farm

Courtesy of Maya Payne Smart, *Energy Empowers*

Alvin Frogue of Frogue Dairy has been in the dairy business for 50 years and until recently one of his top challenges was managing 250 cows with individualized care. Now \$80,540 worth of new dairy technology helps the Guthrie, Kentucky-based farmer keep a closer watch on the milk room--and conserve energy and money. Through a \$10,000 Recovery Act grant, Frogue installed a variable-speed drive vacuum pump, which offers more accurate control of milking, reduces noise and improves udder health and milking quality. He also added a 16-unit automatic take-off milker system to prevent over-milking and reduce vacuum pump runtime and teat end damage. "The grant definitely helped me make up my mind to do it," says the veteran farmer whose daughter-in-law, a computer skills instructor, helps him with new technology. "They pretty well told me that if I did such and such that I would qualify for the grant."

Sustainable Farming

Moreover, Frogue recognized a pressing need for better tools to manage a shrinking labor pool, protect animal welfare and bolster profitability. "Anybody can put a milker on a cow, but it takes someone who knows what they are doing to take them off," Frogue says of the challenges of overseeing unskilled laborers. "We put the technology in to protect the cows more than anything else," he explains. "If they aren't milked right, you can mess up a cow really quick. It saves us a lot of worry and a lot of extra work with veterinarians and sick cows." It also saves considerable electricity and labor. Together the technologies have reduced milking time for his 250 cows from four and half hours to three hours and 15 minutes. In all, the project is estimated to save 25,758 kWh of energy and \$2,432 in electricity costs annually.

Economic impact

Frogue's upgrades are among 82 on-farm energy efficiency and production projects receiving \$696,916 in Recovery Act grants through Kentucky's Governor's Office of Agricultural Policy (GOAP) and Department for Energy Development & Independence. "Increasing producer awareness of opportunities to improve energy efficiency and opportunities for the production of energy crops within the Commonwealth are lasting investments that will have a direct impact on Kentucky's farmers, and the state as a whole," says Len Peters, secretary of Kentucky's Energy and Environment Cabinet. Indeed, \$852,000 worth of energy savings and \$8.4 million of new investment in rural farm communities will be created in the first year alone if all approved projects are completed, estimates Tim D. Hughes, a senior policy analyst in the GOAP. "I've gone out and visited 40 of our projects, and we're helping companies outside of Kentucky that are selling major pieces of farming equipment," Hughes explains. "Local vendors are also benefitting from having salespeople and installers affiliated with getting these projects up and running." And don't forget the direct financial impact for farmers like Frogue who wanted to make upgrades but needed an extra incentive to get it done now amid tough economic conditions in rural Kentucky.



Alvin Frogue, a 50-year veteran of dairy farming, sits at the computer where he now monitors cow conductivity. | Photo courtesy of Kentucky Governor's Office of Agricultural Policy.



Faces of the Recovery Act

Putting People to Work

Merin Roseman, Kentucky Green and Healthy Schools Program

Merin Roseman began working for the Kentucky Environmental Education Council as Coordinator for The Kentucky Green and Healthy Schools (KGHS) Program while she was a student at Eastern Kentucky University earning degrees in English and Geography. As the coordinator, Merin supports schools enrolled in KGHS by offering curriculum resources and environmental project assistance. Merin assists teachers and students as they implement sustainability lesson plans and she develops the online school user and administration web systems and web content for the program. Merin also takes pride in organizing the annual KGHS summits and awards luncheon.

"I enjoy working with the teachers and students and helping them improve their school," said Merin. "I feel like I get to make a difference in the sustainability of the school by improving the school's impact on the environment and increasing student engagement and leadership. The grants we offer schools for energy-saving projects are great because even though they are motivated to become more energy efficient, they often have trouble finding funding for their projects."



Merin Roseman,
KY Green & Healthy Schools Program

Courtney Lewis, School Energy Managers Project

Courtney Lewis became the Energy Manager, part of the School Energy Managers Project (SEMP), for Whitley County Schools and Corbin Independent Schools in August. As an Energy Manager for the school systems, Courtney's priority is to help the schools reduce their energy consumption, saving valuable dollars that flow back into school curriculum.

Courtney is a recent graduate of Eastern Kentucky University, where she earned a Bachelor of Science in Environmental Health Science. While at ECU, she completed two internships, one at Marathon Oil Company, with the Findlay, Ohio Pipeline Environmental Regulatory and Safety department, and one at Appalachia Science in the Public Interest in Mt. Vernon, Kentucky as the lead on a water quality project. Courtney also holds certificates in Emergency Management.

"I enjoy my position because I know what I am doing is having a direct positive impact on the environment," said Courtney. "Getting the students involved in this project will be very rewarding for me because they will take the information they learn about energy efficiency and hopefully apply it in their daily lives and teach others. I am excited that SEMP is bringing energy education to our Kentucky schools. I believe that SEMP is already a success for this state, and many other states are going to use Kentucky as an example for the 'green' movement in their schools, industries, and homes."



Courtney Lewis, Energy Manager

Lona Brewer, Kentucky Department for Energy Development and Independence

Lona Brewer re-joined the Energy and Environment Cabinet in February 2009 to assist in coordinating Recovery Act funds coming into the Cabinet. In August of that year, Lona combined those duties with that of Project Manager for the Department for Energy Development and Independence (DEDI). As a Project Manager for DEDI, Lona manages the On-farm Energy Efficiency and Multi-County Energy Initiatives programs, as well as the Kentucky Green & Healthy Schools Program and, in partnership with the Department for Local Government, the Small Cities and Counties Initiative. Lona coordinates information for all Recovery Act funds coming through the cabinet, ensuring federal and state reporting is complete. Lona also researches other funding opportunities for the Cabinet. Before coming to DEDI, Lona had retired from 31 years of public service in the Department for Environmental Protection, Division of Air Quality.

Lona said that the best part of working for DEDI is "having an opportunity to demonstrate how energy efficiency and renewable energy can have a positive economic impact." She said, "for years I worked on air quality issues throughout the state and had opportunities to see how decisions on energy efficiency could also have a beneficial impact on air quality. We're able to provide funding for projects we wouldn't have been able to do without the Recovery Act, and we have an opportunity to make a lasting difference in energy efficiency and renewable energy in numerous sectors. We've seen evidence of increases in energy efficiency not only saving jobs, but allowing industry to hire more employees, of farmers being able to work more efficiently and save time and money, and for local communities to implement energy saving measures and lower operating expenses, thereby saving taxpayers money in the future."



Lona Brewer, DEDI



Let Your Light Shine: Recovery Act Programs from a Kentuckian's Perspective

Turkey Foot Middle School: Giving Back

Article submitted by Katie Kloska, a student at Turkey Foot Middle School

On May 29th 2010, a ground breaking ceremony was witnessed by hundreds of everyday people, Kenton County School officials, and Turkey Foot Middle School students and staff. This day was a day in history that many will never forget. It was the start of a new school, new educational opportunities, and new ideas. Due to the fact that the people of Kenton County paid taxes, and the Kenton County School District used their funds wisely to create our new school, the students and staff are now experiencing and enjoying the new “green” school. Now, more than ever, we are dedicated to giving back to the community and the public. Our school has already taken a big step for the environment, but we have also taken less noticeable actions for the citizens of Kenton County, Kentucky, and America. Even though the building has only been occupied for less than a year, many contributions have been made by Turkey Foot Middle School to the public.

Publicity and news about school systems or a new school building may not be the most popular scene to be broadcast in other places around the world, but here in Northern Kentucky, these types of articles and broadcasts are a big deal. During the two-year time span of the Turkey Foot Middle School construction, more news has been featured on Turkey Foot than our middle school has ever experienced before. In just this year, we have been featured in news broadcast and papers like the KY Post, WLWT, and WCPO. The news spreads the word about our energy conscious school district and efficient Turkey Foot Middle School, motivating others to be “green” as well. Turkey Foot is a leader in energy efficiency, thus spreading the word about being “green.”

The recession has affected all of us here in America. Millions of jobs have been lost and thousands of families have felt the effects of it. For two years, the Turner Construction Company, PCA Architecture, and CMTA Engineers, all have hired hundreds of workers to create the work of art that we now call Turkey Foot Middle School. This may not have been a worldwide project hiring hundreds of workers in every city and state, but it did make an impact on those affected by the hiring in this area. In fact, CMTA Engineers in 2009 moved up to place 63rd on the Largest MEP Firms. Now, a few hundred jobs have been created in the Northern Kentucky area just because of our new building.

Hundreds of students, parents, and staff walk through our hallways every day. Thanks to our large, yet compact school, it saves room for the environment by taking up as few square feet as possible. People can use it daily without the guilt of squandering the environment. Also included in our school are other features such as natural daylight harvesting, a vegetated roof, a vital signs system, and demand controlled ventilation. A rainwater harvesting system is also integrated into our school to flush toilets. No other school in Kentucky has all of these features that help the environment. Turkey Foot is definitely at the top of the list for being “green”!

Now that all of the construction is completed, the students and staff go to school every day without dreaming of a new building. Now, we as students and staff, live the dream. In addition, the community, environment and world benefit from our new school. Publicity encouraging others to be green, jobs and environmental efficiency are all outcomes of this wonderful building. It is our school. We are all proud of it!

Have you gone green? We want to hear your story!

Did your school earn the ENERGY STAR? Have you had an energy audit on your home? Has your business taken action to reduce energy usage? DEDI is collecting stories from Kentuckians who are taking action with Recovery Act programs to reduce their energy consumption and increase the sustainability of their homes, schools, and businesses. If you would like to share your story, please contact Brooke Smith at 502-564-7192 or brooke.smith@ky.gov.



Let your energy efficiency be an inspiration to others!



Katie Kloska is an 8th grade student at Turkey Foot Middle School, in the Kenton County School District. Katie is 13 years old and enjoys volunteering for her local community with organizations like the Special Olympics. Katie is a dancer and soccer player for Turkey Foot Middle School.

Turkey Foot Middle School Quick Facts

- * Enhanced Geothermal HVAC
- * Insulated concrete form walls
- * Demand control ventilation
- * Energy efficient kitchen design
- * LED parking lights
- * Daylight Harvesting
- * Solar tube lighting
- * Stained concrete flooring
- * Vital signs system
- * Vegetative roof
- * Rainwater harvesting
- * SMART boards in all classrooms
- * The new school is twice the size of the old building but uses 1/3 of the energy

Annual estimated energy savings vs built-to-code = \$70,000/yr

Williamstown Independent scores early 'slam dunk' in energy savingsBy Madelynn Coldiron, Courtesy of Kentucky School Boards Association's *Kentucky School Advocate*

Jon Nipple and Molly McComas check a main meter on the district's campus.

When Energy Manager Jon Nipple started pouring over two years' worth of Williamstown Independent Schools' utility bills he got some help with the analysis from one of the district's school bus drivers. In one of those small-town coincidences the driver, Mike Shoemaker, just happens to be the retired superintendent of the Williamstown Electric Department. Shoemaker reviewed the data the district had pulled together and suggested the school system could save money by switching a major meter on the single campus district from a general service rate to a demand rate. Nipple did more analysis and determined the switch would net the district a projected \$30,000-per-year savings. That, in turn, will generate another \$4,000 annual savings in the power adjustment, which is based on use. "That was really a slam dunk for us," school board Chairman Chris Lawrence said. "This kind of quickly realized savings isn't unusual," said Nipple. "It's really been like that in every district that I work in," he said. "It's not for lack of effort or energy by people. I think it's just that there's no one that has had a real focus on it. And once you start looking at it, there are just a whole lot of opportunities in all these districts."

Nipple's services are shared by Williamstown Independent and Grant, Owen, Carroll and Gallatin county school districts as part of the Kentucky School Energy Managers Project overseen by Kentucky School Boards Association and the Kentucky Department for Energy Development and Independence, and funded with a federal Economic Stimulus grant. He's already more than paid for his salary. In addition to the savings that turned up in Williamstown, he discovered that Grant County High School was being charged sales tax on its electric bill even though it is tax exempt. The eventual rebate is expected to be about \$127,000, plus the \$1,200 per month the district will save going forward. Lawrence said the Williamstown board hasn't yet discussed specifics on how to redirect the anticipated savings. But he said he would expect "to plow it into the students first and the faculty second. Once we do start realizing

the savings, it's definitely going to open up some potential aide positions or program upgrades or whatever else we need at the time." Williamstown Superintendent Sally Skinner said the board is revisiting the district's strategic plan and will be considering some new goals that could become a reality with the money realized through energy savings. The ideas she has, she said, "are all student-centered. The district also is looking at using some of those freed-up funds to buy software that will enable the campus to save even more energy. "I think it could snowball into even more savings," Skinner said. The timing of Nipple's arrival could not be better on another count: the school board is looking at the next phase of a campus renovation project and the energy manager "will be involved" in discussions about how to make it more energy efficient, said Molly McComas, the district's preschool director and dean of students who is acting as the point person for the energy program. Other changes are under way or on their way, including adjusting thermostat settings, paring down the number of refrigerators and microwave ovens in individual classrooms. Changing the type of rate on that meter will save the district \$30,000 per year. McComas notes that no one has even noticed the temperature setting change that's already been made. We're easing into (the changes)" Nipple said. "It's not like it all has to be done right now. It's all going to be done; we'll just do it a little step at a time," Skinner said. While the refrigerator/microwave oven issue may be touchy, the fact that it's being recommended by the energy manager as part of a statewide program will take some of the heat off the local administrators.

Nipple's territory has formed a partnership made up of the point people on the project from each district. The group meets bimonthly to compare notes and share information. The progress made in Williamstown is fairly typical of where the other districts stand with the project, Nipple said, though they are coming from diverse starting points. Carroll County already had a district energy team, for example. Grant County has both Energy Star-rated schools and schools that are among the highest energy consumers. "What I'm trying to do is move everyone together at a certain rate," Nipple said. With his two years of billing history, Nipple is digging underneath to figure out what causes the difference in energy consumption among his region's schools and to establish baselines going forward. While a couple of regions have hired curriculum coordinators to assist in the academic end of the school energy project, Nipple, an engineer who worked in the worldwide training and development group at Lexmark for nine years, is wearing both hats. He's offered to talk to classes and illustrate the practical applications of math or science. "We've got a wonderful workshop - schools can use case studies from their own buildings," he said.

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