

ENERGY EXCHANGE

From Coal Mines to Student Energy Audits, Kentucky NEED is Helping Teachers and Students Learn About Energy

For the past several years, Karen Reagor, NEED's Southeast Regional Director, has been taking Kentucky teachers on a tour of the commonwealth's energy sites as part of Kentucky NEED's annual Energy Tour, letting teachers see where their energy comes from and how it is used. "What we try to do," she explained, "is to show our teachers the economic and environmental sides of energy production as well as the technical side. They talk to the state's top energy professionals about the technologies as well as career opportunities for today's students so that teachers can share the skills students will need for these jobs."

Programs like this tour and a variety of workshops and other activities have helped NEED bring an extensive menu of energy education activities to Kentucky, generating comments from teachers like Robin Thacker who say that "NEED is much more than a curriculum, but a way to build team and leadership skills which can help students succeed beyond the classroom."

"Our energy tour is definitely not a week-long vacation for any of the teachers who join us," Karen emphasized. "We spend five very busy days on a bus visiting a coal-fired plant and a hydropower plant, biodiesel and ethanol production sites, seeing the interior of a coal mine and touring a coal loading facility, and many other energy-related sites around the



state. We take only 24 teachers on this annual tour. After a long day of touring, teachers work with NEED curriculum to apply their knowledge to the classroom."

It is well worth it, though. One teacher who participated in the program called it "the best hands-on experience you will ever encounter!"

Karen coordinates a number of very popular programs in

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Linda Kuhn, a teacher at Gray Middle School in Boone County, KY, learns about clean coal technology during last year's energy tour, which included this stop at the Spurlock Fossil Plant in Maysville, KY.

Youth Awards 2009



Nearly 600 students and their family members, teachers and school administrators attended this year's Youth Awards events June 26-29 in Arlington, VA. Highlights of the long weekend included meeting other NEED students from around the country, trying out new NEED classroom activities, and the always-popular exchange of pins, stickers and other memorabilia at the Parade of States dinner. For a closer look at this year's event, see pages 9-17.

America's Most Wanted?

During a trip through upstate New York, NEED's Todd Rogers met with Kristen Keenan, a third-grade teacher at Cattaraugus Allegany BOCES in Olean, NY. Kristen wanted to try out some new activities so she took NEED's Energy Games and Icebreakers booklet and made arrangements to put on the activities, including "America's Most Wanted Energy Wasters," in her daughter's third-grade class. She went into the class ahead of time and took photos of all the students, printed them out and attached them to "wanted" posters that the students made. The students came up with energy "crimes" and listed some "rehabilitation" plans to resolve them. Todd added powerpoint slides illustrating the 10 energy sources they were studying to go along with their posters and their ideas on how to fix the energy wasters. Kristen said she felt very comfortable delivering these activities, and the students all enjoyed catching the "criminals" who were wasting energy. The Energy Detectives program is sponsored in western N.Y. by National Fuel.

Two third-grade students play energy detectives as they learn about ways to stop wasting energy.



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NEED Announces Short Courses and Workshops for NSTA Regional Conferences

If you're planning to attend one of the National Science Teachers Association (NSTA) regional conferences this fall, be sure to come to some of the NEED programs being offered.

One of the highlights this year will be a new hour-long presentation on "Integrating Nonfiction Reading and Writing While Teaching About Energy." The schedule for the three fall conferences:

NSTA Regional, Minneapolis, Oct. 29-31

- Session 217, *Energy Concepts Measure Up*, Friday, 10/30, 8 - 9 a.m.
- Session 225, *Integrating Nonfiction Reading and Writing While Teaching About Energy*, Friday, 10/30, 9:30 - 10:30 a.m.
- Session 276, *Exploring Solar Energy*, Friday, 10/30, 11 a.m. - noon.

NSTA Regional, Fort Lauderdale, Nov. 12-14

- Short Course, *Energy From the Sun*, TBD
- Session 207, *Energy and Climate*, Thursday, 11/12, 12:30 - 1:30 p.m.
- Session 245, *The Great Energy Debate Game*, Friday, 11/13, 12:30 - 1:30 p.m.
- Session 211, *Integrating Nonfiction Reading and Writing While Teaching About Energy*, Saturday, 11/14, 11 a.m. - noon.

NSTA Regional, Phoenix, Dec 3-5

- Session 213, *Integrating Nonfiction Reading and Writing While Teaching About Energy*, Thursday, 12/3, 2 - 3 p.m.
- Session 270, *Exploring Solar Energy*, Friday, 12/4, 12:30 - 1:30 p.m.

Check the calendar in upcoming issues for dates of short courses and workshops scheduled for the NSTA National Conference in Philadelphia March 18-21, 2010. Conference information is available at www.nsta.org/.



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The NEED Project is a 501(c)(3) nonprofit education association providing professional development, innovative materials correlated to the National Science Education Content Standards, ongoing support, and recognition to educators nationwide.

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Teacher's Perseverance Pays Off With Solar System for His School

Bret Sutterley of Turlock, CA, thinks the last week of April this year was one of the greatest weeks he's ever had. "I got to throw the switch on our solar array for the first time. It is now producing energy back into the grid, very aptly timed during our City of Turlock 'Go Green Week' -- a week of environmental awareness for our schools provided by the city."

The solar array he talked about has been a two-year project to create, and is just phase one of completing an Alternative Energy Center on the Walnut Elementary Education Center's campus. Phase two is the completion of a small wind turbine that will provide power to the school's garden area. Bret explained that "my goal is to provide grid- and off-the-grid energy production on campus for our kids to see and experience first-hand. I believe our school will be the first to house such a center in all of California."

Both of these projects were created by grants. The turbine was funded through a BPA+ for Energy Grant he wrote and received in 2006. "Thanks to this grant, I was able to teach my students about wind and other forms of energy production, build small generators with KidWind models, visit the wind farm at Pacheco Pass, and also purchase the wind generator itself," he explained. "The process hasn't been easy by any means so far as approval to build. Our campus will apparently be the first in California to have a generator, so that meant lots and lots of red tape for us. But we were granted permission by the state, and construction will begin soon."

The solar array was funded through a proposal to the Turlock Irrigation District (TID), which supplies the school's electricity.

Having attended PG&E Solar Schools/NEED training and learning that Pacific Gas & Electric Company provides PV systems and Bright Ideas grants to schools, Bret learned that his school didn't qualify for a PG&E array because they are not in PG&E's service territory. Instead, he drafted a proposal

to TID asking for a donation to fund such a project. Bret said that "I was pleased to learn that my proposal was accepted and I was granted \$20,000 to install a PV system. After receiving the funding notification in the spring of 2007, it has finally become a reality in 2009. Tenacity pays off. I give a great amount of credit to Nancy Folly who worked long hours to make this possible at TID, and to my

principal Mark Holmes who worked tirelessly to make it happen on the school district end of things. It is our goal to make energy education a part of every child's educational experience on our campus, and to encourage others in our community to come and see the sun and wind put to use to create clean, renewable energy."

NEED's Barry Scott noted that "Bret attended his first Solar Schools workshop in December 2006 in Stockton, and his enthusiasm for teaching kids about solar energy was contagious! After the workshop, he came to me disappointed

that his school does not receive PG&E electrical service and was therefore ineligible for the I-kW solar 'on a stick' grant. I suggested to him that he take one of the Solar Schools program brochures to his school's utility provider, the Turlock Irrigation District, and to ask them, in so many words, "Why don't you have a program like this for our schools?"

Barry explained that he has stayed in touch with Bret, who helped to coordinate another PG&E Solar Schools workshop in August 2007 for teachers further south in the Merced and Turlock area at his district's new school site. "I'll never forget how excited Bret was to share the terrific news with me that morning as teachers were arriving," Barry said. "It had taken more than one visit, and he had to talk to more than one person, but Turlock Irrigation District had finally found a way to support his school with funds to install a 1-kW system for his school!"

Bret tells teachers that "My work and perseverance was well worth it. For those of you who are out there thinking of creating such a project, go for it! You can do it!"



Following installation of the PV system, Bret Sutterley (center) discussed the project with the contractors, Brad Price (left), owner of Valley Solar, and one of his employees.

NEED Students Participate in “Oil & Gas Day” at New Mexico Capitol

The Independent Petroleum Association of New Mexico (IPANM) sponsored an "Oil & Gas Day" at the New Mexico Legislature on February 12. NEED was invited to participate by setting up and staffing an informational display in the Halls of History at the "Roundhouse," the home of the New Mexico Legislature.

Robert and Barbara Lazar (both recipients of BP's A+ for Energy grants and long-time NEED teachers and facilitators) brought six of Robert's Energy STARS students from Cleveland Middle School in Albuquerque to conduct energy activities and speak with legislators about their NEED activities.

The event made quite an impression on the students. "Wow, I didn't know so many people were involved in the energy business," said Nick. Brittanie added that "We met Harry Teague, the newly elected United States Congressman, who visited our display table and took a picture with all of us. It was way cool!"

IPANM has long supported NEED workshops and materials for New Mexico teachers and students.



This display was set up by Robert Lazar's "Energy STARS" from his eighth-grade class at the award-winning Cleveland Middle School in Albuquerque, NM. It was located in the East Lobby of the Halls of History at the New Mexico State Capitol in Santa Fe. Barbara Lazar is standing behind the display table. She and Robert have both been very involved with NEED programs for several years.

TXU Solar Academy Brings NEED Energy Education to Thousands of Texas Students

This year, 15 schools across Texas will be getting 1-kW photovoltaic systems as part of the TXU Energy Solar Academy. According to NEED's Melanie Harper, who handles many of the program's educational components, these systems will open up a whole new range of classroom activities to involve the students in understanding solar energy.



Fifth-grade students at Morton Ranch Elementary School in Katy ISD, TX, watch as principal Elisa Farris cuts the ribbon at their new 1-kW solar panel. Assisting her is superintendent Alton Frailey.

"TXU donated these photovoltaic systems to 10 schools last year," Melanie explained, "and it's very exciting that the program is being expanded this year with plans to keep it growing every year. TXU intends to eventually have systems installed at 40 schools."

NEED's education component in this program has been designed to help teachers meet the Texas Essential Knowledge and Skills (TEKS) requirements and to help students and their families understand solar energy technology. Having a solar installation at the school provides a powerful demonstration of the technology for the entire community.

TXU is a retailer providing electricity and related services to more than two million customers in Texas. The TXU Energy Solar Academy was established to help schools in their service area bring the latest solar energy lessons and technology to their classrooms, using NEED instructors and resources to provide the educational materials and teacher training. Teachers receive materials and training on solar energy for use in science, geography and math classes. The NEED training stresses hands-on, interactive teaching tools and lessons geared toward students throughout the entire K-12 range. Melanie said "Our day-long NEED training programs for the teachers in the TXU Solar Academy cover the *Science of Energy* activities in the morning and then a full afternoon with solar activities. Teachers tell me they feel much more comfortable teaching the material after attending our program."

While the systems are installed by local contractors, Melanie and other NEED staff members conduct the training programs and coordinate many of the program details. "Once we choose a school for installation of the system," she said. "I work with that school district to set up training and take care of many details from providing materials to help administrators understand and describe the systems to their staff to arranging for a ribbon-cutting ceremony when the system is completed."

One of the keys to the popularity and success of the program is the monitoring equipment that is installed with each system. The information on the system's electrical output displays on a web

site with real-time data. "Students can see the current data for their school, how much power is being produced, what the peak times are, and they can also click on the site and open data acquisition sheets that give them electrical output since the day the system was installed," she added. "What I especially find useful is that the students can easily do comparative studies with other schools around the state and country, see the weather conditions and how they are affecting panel production, and actually do detailed studies on systems far from their own sites."

You can view data on all the schools in the program and learn more about these activities at www.txu.com/solaracademy. Participants in the program receive a variety of NEED materials, classroom sets, and a solar kit as well as other classroom materials and information.



Candy Ochoa, science coordinator at Goose Creek ISD in Baytown, TX, cuts the ribbon on a new photovoltaics system. She is assisted by TXU employees Colette Vallot and Jason Schultz.

One of the PV systems was installed last year at Kirby Junior High School in the Wichita Falls ISD. According to Steve Henderson, their secondary science specialist, "Our teachers really enjoyed the TXU Energy Solar Academy training with Melanie. One of my junior high teachers took the materials from his solar kit and fastened the mini-solar panels to his classroom globe. Now his students really understand the idea of the Earth's seasons." Melanie noted that "the feedback we get from teachers participating in this program is fantastic. They love the hands-on learning and can hardly wait to use their solar kits with their students in the classroom. Many of the elementary and middle school teachers choose the kits with solar ovens and their students love it when they bake cookies or make snacks for the class."

"TXU Energy's commitment to alternative energy is exemplified in the Solar Academy Program and our partnership with NEED," said David Chen, Program Manager, TXU Energy. "With the need for renewable energy ever-increasing, it is truly crucial to educate future generations about the importance of solar power."

Cape Light Compact Receives Prestigious Energy Award

Among the outstanding energy and environmental programs honored in April by the Massachusetts Executive Office of Energy and Environmental Affairs was the Cape Light Compact's Energy Education Program.

The 15th Annual Secretary's Awards for Excellence in Energy and Environmental Education honored a number of schools and non-profit organizations that, according to the commonwealth's Energy and Environmental Affairs Secretary, "go beyond standard school curriculum, encourage students, teachers and communities to embrace efforts to protect the planet, reduce waste and build awareness of how energy is produced and conserved."

The Cape Light Compact is an energy services organization in Barnstable, MA, made up of 21 towns on Cape Cod, Martha's Vineyard and two Massachusetts counties. They represent and protect consumer interests by operating an energy efficiency program and working with their region's consumers to negotiate for economical electricity and other public benefits.

"At the heart of our education program," according to Debbie Shiflett-Fitton, coordinator of the organization's energy education programs, "we owe our success to our close partnership with the NEED Project. NEED helped us start up our program in 2002 and continues to be an important support system and resource for all our energy education needs."

The Compact's energy education program includes ongoing teacher workshops using NEED curriculum materials, offered free to local teachers. Participants not only attend the workshops and get many NEED materials, but become part of a network of teachers from the area interested in science education and receive ongoing energy curriculum materials, ideas and support.

Right: The Bourne (MA) Middle School Energy Savers Club is made up of students in grades 6 through 8. Michael Doyle, Olivia Milsted and Ben Haskell (left to right), who were all very active in public energy education outreach, used a series of NEED games to engage the public at a Cape Light Compact energy fair. Ben and Michael have since graduated 8th grade and will bring their interest in energy education to their new high schools.



Above: A NEED-trained teacher reads a story from the NEED Infobook about the formation of coal and discusses coal mining with students at an energy carnival held at Mattacheese Middle School in Yarmouth, MA. A team of students "mine" chocolate chips from cookies to understand the mining process. The Cape Light Compact puts on programs like this one at schools throughout their area every year.



For more information on the organization and their energy education programs, visit <http://www.capelightcompact.org/>.

Kentucky (continued from page 1)

Kentucky besides the tour, including a partnership with the Kentucky Department for Energy Development and Independence (KYDEDI) that provides \$350 mini-grants to schools and other non-profit organizations to conduct *Change the World, Start with ENERGY STAR* projects in their



Kentucky teachers visited the Spurlock Fossil Plant in Maysville, KY, for the dedication of a new 268-megawatt unit using a cutting-edge clean coal technology known as circulating fluidized bed process, making it one of the cleanest coal-powered units in the nation.

schools and communities, and KYDEDI-sponsored energy management workshops to help guide the state's schools in creating effective energy management programs. "These workshops are especially valuable when our energy costs are so volatile. The program helps school administrators and facilities staff as well as the students, teachers and curriculum specialists to better understand how energy influences their daily lives and how they can develop real energy solutions to achieve real savings," according to John Davies, Deputy Commissioner of KYDEDI.

"What I especially like about the workshops," Karen explained, "is that we get all the key groups in a school from the teachers to the maintenance staff working together as a team to develop a plan that will help reduce energy consumption. You've got the

teachers there, who discuss energy in grades 4, 7 and 11 where it is tested statewide, working with the administrators who are dealing with ever-tighter budgets as energy costs cut into their available resources."

Energy management skills like those taught in these workshops can help make a big difference to the schools.

Energy management and efficiency programs have already paid big dividends in Kentucky, where one school district (Bullitt County) saved nearly \$250,000 in energy costs in 2007-2008, and another (Kenton County) has saved around \$1,000,000 since starting their energy management program in 2005. These schools alone have each saved enough to fund at least five teacher positions.

There are other NEED activities in the state that are also having a strong impact on teachers. The State Legislature has been focusing on improving Kentucky's energy efficiency, and a House bill has a provision that all school districts must enroll in KEEPS (the Kentucky Energy Efficiency Program for Schools). This non-profit effort funded by KYDEDI provides technical audits for schools, and NEED is the education partner providing training and establishing student energy teams with school districts. NEED has developed a guidebook and piloted two programs and will be conducting two more workshops this fall.

The KEEPS activities, voluntary programs at the state's schools that began as a pilot in 2006 and went statewide in 2008, have saved about \$1.2 million in utility costs. Karen noted that state officials attribute about 10 percent of that savings directly to what students are doing to save energy in their school buildings. The students actually get to measure, assess and monitor their school's energy consumption and then develop a plan

to reduce that energy use. An extra benefit, according to one school principal, is that because of this program, the students not only made a change in their school building, but they have been changing the attitudes of their families as well. They're turning off unused lights and unplugging nonessential machines at school, then going home and seeing what they can do there to use energy more wisely.

Programs like a trip down into a coal mine and teams of administrators, teachers and facility personnel working together for energy management get NEED involved in activities impacting educators, students and their



Participants in the Kentucky Energy Tour traveled by train to the historic Blue Heron coal camp, an oral history center where the people who actually lived and worked there tell their story through recordings housed in "ghost structures" – representations of where the actual buildings once stood many years ago.

communities. As Angela Spencer, principal of White's Tower Elementary School explained, "I have never really considered myself passionate about the environment. But since our NEED team began teaching us more about energy consumption and conservation. I have made some changes at home as it relates to energy use. This is good for our environment and our local economy as well."

2009 National Youth Awards for Energy Achievement

NEED is pleased to announce the following winners of this year's Youth Awards, who were honored for their achievement at the National Recognition Ceremonies in June in Washington, D.C.

Primary Level

Huntingdon Primary School
(TN) *Primary School of the Year*

Central College Magnet
School (OH) *Primary Finalist*

Mt. Salus Christian School
(MS) *Primary Finalist*

Elementary Level

A.K. Suter Elementary School
(FL) *Elementary School of the Year*

Frank C. Whiteley Elementary
School (IL) *Elementary Rookie of the Year*

John F. Kennedy Elementary
School (MI) *Elementary Finalist*

James A. Caywood Elementary
(KY) *Elementary Finalist*

Annehurst Elementary School
(OH) *Elementary Finalist*

Madawaska Elementary School
(ME) *Elementary Rookie Finalist*

Ogden Elementary School
(NC) *Elementary Rookie Finalist*

Junior Level

St. Isidore School (NE) *Junior School of the Year*

West Carroll Elementary
School (TN) *Junior School of the Year*

La Mariposa Montessori (NM)
Junior Rookie of the Year

St. Margaret Catholic School
(LA) *Junior Finalist*

Park View Middle School (RI)
Junior Finalist

Heritage Middle School (OH)
Junior Finalist

Ashland Community Middle/
High School (ME) *Junior Rookie Finalist*

Senior Level

Fayette Academy (TN) *Senior School of the Year*

Indianapolis Metropolitan High
School (IN) *Senior Rookie of the Year*

William Henry Harrison High
School (OH) *Senior Finalist*

Scituate High School (RI)
Senior Finalist

Russell Area Technology
Center (KY) *Senior Finalist*

Special Project

Sumner County 4-H (TN)
Special Project of the Year

West Clermont Local Schools
(OH) *Special Project Rookie of the Year*

Mountain View Elementary
School (TN) *Special Project Finalist*

McMinn Central Go Green
Project (TN) *Special Project Finalist*

Westerville City Schools
(OH) *Special Project Finalist*

Youth Awards 2009



NEED Chairman Richard Zuercher kicked-off the Youth Awards' 29th Annual National Recognition Ceremonies with welcoming comments to the 600 students, family members, teachers, and school administrators in attendance. The event was held in downtown Washington, D.C. at the Harman Center for the Arts.

The following brief write-ups on the national award winners highlight only some of the activities that earned them this recognition. We would need much more space on these pages to list all of their creative activities that ranged from teaching other students to putting on programs for the community and using NEED materials in a wide variety of education programs. Visit www.need.org and read the *Annual Report 2009* for more information on these outstanding programs.



PRIMARY LEVEL SCHOOL OF THE YEAR: Huntingdon Primary School, Huntingdon, Tennessee. Project Adviser: Connie Bond.

Third-grade students in the school's Wiser Miser Energy Team took five energy-related tours, held after-school meetings, raised more than \$2,500 with recycling projects, and participated in NEED activities. In addition to donating \$300 to Habitat for Humanity to buy CFL light bulbs, they sold 1,080 CFLs and raised \$1,940 to help needy families with their electric bills.



ELEMENTARY LEVEL SCHOOL OF THE YEAR: A.K. Suter Elementary School, Pensacola, Florida. Project Advisers: Judy Toy and Deborah Pate.

Using NEED materials to teach about solar energy, the students had an energy booth at the school's fish fry, an *Energy Jeopardy* booth during the Fall Festival, and made energy placemats for local restaurants. They recycled phone books, Christmas tree ornaments and food from the local food bank. They put on a school play called "Recycled Joy" and they had a compost bin and rain barrel to use in their garden.

JUNIOR LEVEL SCHOOL OF THE YEAR: St. Isidore School, Columbus, Nebraska. Project Adviser: Mary Lou Green.

Students went to homes, business and community events, collecting 1,916 signatures of people pledging to change their light bulbs to CFLs and also change their way of living to reduce greenhouse emissions. They worked with other students, faculty, and the Scotus High School science teacher to use NEED materials in their classrooms.



JUNIOR LEVEL SCHOOL OF THE YEAR: West Carroll Elementary School, Trezevant, Tennessee. Project Adviser: Mollie Vann.

Student Energy Explorers took several field trips to explore renewable and non-renewable energy sources, used NEED activities in meetings and workshops and worked with community leaders and guest speakers to help share information on energy awareness and conservation throughout their school and community.



SENIOR LEVEL SCHOOL OF THE YEAR: Fayette Academy, Somerville, Tennessee. Project Adviser: Donna Burrus.

Attending school and community festivals and meetings gave the students many opportunities to give out more than 2,700 CFLs and 12,000 insulators for light switches and electrical outlets. Many community leaders got involved in their activities, and local aldermen joined the TVA Green Power Switch program and the county mayor participated in the Tennessee Department of Economic and Community Development community energy education project.





Special Project of the Year: Sumner County 4-H, Gallatin, Tennessee. Project Adviser: Clint Parker.

One of their major accomplishments this year was teaching students how energy was used and how it can be saved. Activities like running a boat with a candle and steam, using glo-sticks and hand warmers to teach about energy, and obtaining more than 500 pledges to *Change A Light* (saving their county \$28,000) helped show how kids can make a difference and help their parents reduce their energy costs.



Student Leader of the Year: Casey O'Connor, Scituate (RI) Middle School.

Casey led NEED activities at many community events and managed a NEED project. He worked with a local high school to spread the word about efficiency and renewable energy.

NEED Youth Leadership Award: Lauren Beatty, Kankakee (IL) High School.

Since she was 10 years old, Lauren has been participating in many NEED workshops and summer camps, including Illinois' Camp K.E.E.P. This award includes a \$1,500 college scholarship.



STATE OF THE YEAR: Texas.

During the past year, more than 1,000 Texas educators were trained and provided with NEED resources. Major educational resources distributed in 2008-2009 included the TXU Energy-sponsored *Photovoltaics Kits*, Shell-sponsored *Fossil Fuels to Products Kits*, classroom sets of *Energy Infobooks*, a new SPE Oil and Natural Gas book, and ConocoPhillips resources that provided energy education for smaller communities as well as to teachers and students in the Houston area. We thank those sponsors and partners shown below and the others who could not attend Youth Awards for their support and their outstanding educational programs and activities.



David Chen accepts the TXU Energy Solar Academy award from Whitney Newman.



Rachael Spencer (left) presents the EnCana award to Susan Thompson.



Whitney Newman presents the Houston Museum of Natural Science award to Daniel Burch and Claire Scoggin.



Terri Drabik O'Reilly (right) accepts the Shell Oil Company award from Rachael Spencer.



Linda Lung

DISTINGUISHED SERVICE AWARD: Linda Lung, National Renewable Energy Laboratory, Golden, Colorado.

Linda Lung has managed the education programs at the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) for more than 17 years. She is a founding member of the DOE science education team and has developed a number of successful science education programs in use nationwide and in many NEED classrooms. She is a technical advisor to NEED on renewable energy curriculum and activities and is a strong proponent of NEED as a resource for DOE and the national laboratories. Linda's leadership in programs like the Junior Solar Sprint and the DOE National Science Bowl has made a huge impact on students, teachers, and communities around the country.

DISTINGUISHED SERVICE AWARD: Lena Cook, Sue H. Morrow and Ulis Newton Elementary Schools, Henderson, Nevada.

A teacher in Clark County, NV, for 31 years, Lena Cook has been a Gifted and Talented Education specialist for the past 26 years, and has been involved with NEED since the 1980s. She actively promotes energy education in workshops, educational TV presentations and many publications. Lena is a strong believer in "kids teaching kids" and gets her students involved in a wide variety of energy education activities. She is especially proud of her many former students who have stayed active in energy education efforts through middle and high school and even into their working careers.



Lena Cook (left) with Mary Spruill



Galen Cobb

DISTINGUISHED SERVICE AWARD: Galen Cobb, Halliburton, Houston, Texas.

As Vice President of Industry Relations for Halliburton, Galen Cobb is responsible for the company's industry relations global activities. His current responsibilities include managing the company's industry relations, energy trade policy issues, executive client relations, and trade organization oversight. He is active with a number of NEED sponsors and partners and is dedicated to the advancement of energy education and to the engagement of students in science, technology, engineering, and mathematics education. Galen works to bring together organizations seeking to improve the quality of energy education curriculum and teacher professional development. His wise and encouraging expertise has been an asset to NEED for many years.

Congratulations to all students and teachers who participated in NEED's 2009 Youth Awards program.



Students from Robert E. Lee Elementary School in Tennessee learned about circuits and electricity while using activities in NEED's Electroworks Curriculum.



Students, family members and teachers from Urbita Elementary School in San Bernardino, CA, rode the subway to see the sites in D.C. At last report, none of them got lost.

The NEED Youth Awards are really all about the energy of kids!



Youth Awards winners traded trinkets, Moon Pies, pins, coal and more at the Parade of States Dinner.



Dancing onboard the cruise ship was a popular activity for all ages. Somehow the DJ knew exactly the right songs to play!



Students like Whitney Newman and Lauren Beatty helped make the event go smoothly, from working on the logistics planning the major activities to getting the water bottles and other giveaways ready for the student teams.



Making a funny face for the camera is always fun for teachers and parents as well as for students.



It's a whole different city when you see it from the water, and these students are certainly enjoying their cruise on the Potomac.



Thank you to all the student leaders who made the Youth Awards program go so smoothly.



One thing about Youth Awards – you never go home hungry.



2009 Youth Awards attendees participated in wind activities.



NEED secondary school students prepared hydropower activities to share with other students.



NEED students worked with Shell's Terri Drabik O'Reilley on wind turbine experiments.



It really works! The final step in the wind power activities is to see if your turbine actually generates electricity. After all their work designing and building their wind turbines, these students are enjoying that first moment of seeing the blades spinning when the wind from the fan hits them.



Teams spent a full day during the weekend activities riding D.C.'s Tourmobile to the city's sites. This group from Kankakee, Illinois, was just starting out from Arlington Cemetery for their visit to dozens of historic locations throughout the area.



How low can you go? Students enjoyed the limbo contest during the evening cruise on the Potomac.



It's so easy, a teacher can do it! NEED's Melanie Harper shows students how to build their own water wheel.



Members of the Wisser Miser Energy Team at Huntingdon Primary School in Tennessee – winner of this year's Primary Level School of the Year Award – enjoyed celebrating their achievement during the weekend activities.

BP Solar Supports NEED Program in Maryland With Frederick County Public Schools

Thanks to funding from BP Solar that supports a partnership between them, NEED, and Frederick County (MD) Public Schools (FCPS), NEED staff conducted several energy and environmental workshops for FCPS teachers this year.

Two sessions on renewable energy and climate change were held at their January teacher in-service. The following month, 25 eighth-grade teachers from each middle school and environmental science teachers from each high school in the county attended a NEED wind energy training workshop (see picture below).

According to Colleen Beall, the county's Middle School Science Teacher Specialist, "The goal of this training was to provide the teachers with the current knowledge, resources, and applications of wind technology as a form of alternate energy. This outstanding training provided each middle and high school with a wind energy kit to be used directly by our students. The NEED materials and training have been well received by teachers and students, and teachers were able to go back to their classrooms and incorporate what they learned as well as the materials easily into their lessons."

This was the third year of NEED programming as part of the FCPS—BP partnership.



Four teachers from Frederick County Public Schools conduct a wind energy activity that they will do with their students. During a NEED Wind Training program for high school environmental science and middle school 8th-grade science teachers held in Frederick, MD, in February, they designed wind turbine blades and are testing them using a fan. The teachers are, from left, Suzie Folk (Urbana H.S.), Elizabeth Paul (Heather Ridge School), Sharon Steger (Middletown H.S.), and Kim Thrasher (Brunswick M.S.). All materials used in the program came from the NEED wind kit each school received.

Teacher Talk ... with Christine Lauer

This is the first in our new series of teacher tips and classroom ideas.

This issue's teacher is Christine Lauer, a high school science teacher at Woodstock High School in Woodstock, Georgia. We asked her how she is using NEED materials in her classes.

I think my favorite NEED activity is the *Great Energy Debate*. I do this in the very beginning when the kids haven't had any other energy lessons. I treat it sort of like a practice run and when they start really getting into it, I stop it, and tell them we will do this for real in two weeks. I then tell them to start preparing for this lesson and research the advantages and disadvantages of their assigned energy sources as well as the other students' sources. They need to pay special attention to learning how the other students will defend their energy sources and their disadvantages.



Christine Lauer

It's amazing how competitive they become, making signs with slogans, advertisements and displays. They dress up and come to class with so much research that I always learn a lot from what my students bring to the debate. All of this activity happens between the practice debate that kicks this off and then the "real" *Great Energy Debate*.

I also find that the *Science of Energy* labs are always a hit. The lessons really help the students understand the concepts and most of all understand what things are needed to complete experiments using the various science processes.

When I taught middle school, the kids always enjoyed going to the elementary schools and teaching those students using the labs and the *Mission Possible* activity. My students would make cards to pass out and they had speeches to try to get the younger kids to choose the power source they represented.

I am planning on using a lot of the NEED activities this coming year as I will have all Environmental Science classes. These classes are made up of mostly

kids who do not excel in math or they would have taken an honors class in chemistry, or physics instead, so the NEED materials will get great use in my classes. Next year, we will be adding an AP Environmental class and I see many uses for the NEED materials there as well.

I've also been thinking about activities for this fall that would be good to use during Energy Awareness Month. This fall in my environmental science classes, I plan to use the NEED *Transportation Fuel Expo* materials and the PBS NOVA "Car of the Future" web site to encourage the students to research available cars and the types of fuels these cars use. The students will then design their own car of the future. They will make some sort of model, poster, or something within reason, and then they'll choose the fuel that they think works best for the car. Then they will produce a commercial that can be in movie or podcast form. It will give loads of information about



One of Christine's students holds his model solar car up to the sun and celebrates its performance during their lessons on transportation fuels.

energy, fuel and the car the student designed and how this type of car will affect the environment. I will give the students basic requirements and also a rubric to guide them. I think this will be of high interest as many students will be getting their driver's licenses this year and working to purchase a car. Who knows? If the students really get into this, as in past years, we may get involved in the *EV Challenge for High School*.

Primary and Elementary Lesson – Introduction to Weather

Question: How is the weather different because of where you live?

Background: Weather is the condition of the atmosphere at a particular time and place. When you listen to the weather report on TV, the meteorologist may tell you several measurements of the atmosphere such as temperature, humidity, cloud cover, and chance of precipitation. All of these measurements describe the atmosphere. Knowing the temperature is one of the most helpful pieces of information when making decisions for your day. Use the following activity to compare the temperature in five different locations in the United States.

Materials: Internet access, pencil, graph paper, ruler or Excel.



Procedure:

1. Record the date in the first row of the data chart and the name and state for your town in the third row.
2. Go to www.weatherbug.com.
3. In the upper right hand corner type in your zip code. Click “Go.”
4. Record the high and low temperature for your town.
5. Find the five cities listed in the data chart in “Temperatures at a Glance: U.S. City Weather.”
6. Record the high temperature and the low temperature for each of the five cities listed.
7. Create a double bar graph of the data from the data chart.

Date		
City, State	High Temperature	Low Temperature
Atlanta, Georgia		
Boston, Massachusetts		
Chicago, Illinois		
Houston, Texas		
Seattle, Washington		

Conclusion:

1. Which city had the highest temperature today?
2. Which city had the lowest temperature today?
3. Which city had the greatest difference between the high and low temperatures?
4. Which city has temperatures most like your hometown?
5. What do you predict the temperatures will be in these cities tomorrow? What do you think the temperatures will be three months from now? Why might the temperatures stay the same or change?

Note to Teachers: You may need to modify this activity to meet the needs of your students. Completing this activity as a whole class, limiting the number of cities you are comparing, or extending the activity over a period of time are just a few suggestions.

Intermediate Lesson – Introduction to Climate Change

Question: How do daily weather conditions compare to climate averages?

Background: Weather is the condition of the atmosphere at a particular time and place. Climate is the average weather measured over many years.

Climate conditions can help you predict what the weather will be at a particular time and place. However, the actual weather may be warmer or colder, wetter or drier. Use the following activity to compare the weather and climate at a particular time and place.

Materials: Internet access, pencil, graph paper, ruler or Excel.

Procedure:

1. Select a location and a date 25 years in the past.
2. Go to www.wunderground.com/history/.
3. Enter the location and date and click submit.
4. Record the date in the data chart.
5. Record the actual mean temperature in the data chart.
6. Record the average mean temperature in the data chart.
7. Add five years to the date. Change the year and click view.
8. Repeat steps 4-7 five more times.
9. Create a multiple-line graph of the data from the data chart.



Location:						
Dates						
Actual Mean						
Temperature						
Average Mean						
Temperature						

Conclusion:

1. How are the lines created by the actual data different than the lines created by the average data?
2. How does the actual weather compare to the average weather? Describe how much the actual weather varied from the average weather.
3. Explain how the actual mean temperature would be calculated.
4. Explain how one of the average temperatures would be calculated.
5. If you were to travel to this city on this date next year, what type of clothing would you wear?

Secondary Lesson – Introduction to Climate Change

Question: How do daily weather conditions compare to climate averages?

Background: Weather is the condition of the atmosphere at a particular time and place. Climate is the average weather measured over many years. Climate conditions can help you predict what the weather will be at a particular time and place. However, the actual weather may be warmer or colder, wetter or drier. Use the following activity to compare the weather and climate at a particular time and place.

Materials: Internet access, pencil, graph paper, ruler or Excel.

Procedure:

1. Select a location and a date 25 years in the past.
2. Go to www.wunderground.com/history/.
3. Enter the location and date and click submit.
4. Record the date in the data chart.
5. Record the actual temperatures in the data chart.
6. Record the average temperatures in the data chart.
7. Add five years to the date. Change the year and click view.
8. Repeat steps 4-7 five more times.
9. Create a multiple-line graph of the data from the data chart.



	Location:						
	Dates						
Actual	Mean						
	Temperature						
	Maximum						
	Temperature						
	Minimum						
	Temperature						
Average	Mean						
	Temperature						
	Maximum						
	Temperature						
	Minimum						
	Temperature						

Conclusion:

1. How are the lines created by the actual data different than the lines created by the average data?
2. How does the actual weather compare to the average weather? Describe how much the actual weather varied from the average weather.
3. Explain how the actual mean temperature would be calculated.
4. Explain how the average mean temperature would be calculated.
5. On average, how much does the temperature vary on this particular date? Use the data you collected to support your answer.
6. How would the graph change if you showed 50 years of 5-year intervals? How would it stay the same?
7. Many people like to know the temperature and the precipitation when visiting. How would a graph of precipitation be the same? How would it be different?

Calendar of Events

August 2009

1-2 Idaho Facilitator Training
(Idaho Falls, ID)

3-6 Idaho Energy Education
Conference, sponsored by INL
and the Department of Education
(Idaho Falls, ID)

6 Kansas Wind Energy
Workshop, sponsored by the
National Renewable Energy
Laboratory (Newton, KS)

10 NEED sessions at the
Center for Middle Eastern
Studies (Cambridge, MA)

19 Massachusetts Energy
Workshop, sponsored by the MA
Dept. of Energy Resources
(Marlborough, MA)

September 2009

21 Georgia Energy Workshop,
sponsored by the Georgia
Environmental Facilities Authority
(Augusta, GA)

22 Georgia Energy Workshop,
sponsored by the Georgia
Environmental Facilities Authority
(Atlanta, GA)

22 New York Hydrogen
Workshop, sponsored by the
U.S. Department of Energy
(Nassau, NY)

22 Houston Energy Workshop,
sponsored by ConocoPhillips
(Houston, TX)

24 Pennsylvania Energy
Workshop, sponsored by
ConocoPhillips (Trainer, PA)

30 Colorado Energy Resources
Workshop, sponsored by EnCana
(Denver, CO)

October 2009

6 Virginia Energy Workshop,
sponsored by Dominion - North
Anna Nuclear Information
Center (Mineral, VA)

6 Colorado Energy Resources
Workshop, sponsored by EnCana
(Rifle, CO)

7-10 NEED workshops at the
North American Association of
Environmental Education
Conference (Portland, OR)

7 Virginia Energy Workshop,
sponsored by Dominion - Surry
Nuclear Information Center
(Surry, VA)

7 Ohio Energy Workshop,
sponsored by ConocoPhillips
(Columbus, OH)

8 Energy Awareness Month
Workshop, sponsored by the
National Ocean Industries
Association (Colorado Springs,
CO)

13 Lubbock Energy Workshop,
sponsored by ConocoPhillips
(Lubbock, TX)

17 New York Energy Workshop,
sponsored by ConocoPhillips
(Brooklyn, NY)

20 Colorado Energy Resources
Workshop, sponsored by EnCana
(Erie, CO)

22-25 NEED workshops at the
California Science Teachers
Association Conference (Palm
Springs, CA)

22 Alaska Energy Workshop,
sponsored by ConocoPhillips
(Anchorage, AK)

29-31 NEED workshops at the
NSTA Regional Conference
(Minneapolis, MN)

November 2009

12-14 NEED workshops at the
NSTA Regional Conference (Ft.
Lauderdale, FL)

December 2009

3-5 NEED workshops at the
NSTA Regional Conference
(Phoenix, AZ)

*Check www.need.org for updates, locations
and more information on these programs.*

Warren County (KY) Public School System Named a “Star of Energy Efficiency”

On September 17th, the Alliance to Save Energy will be honoring the Warren County (Kentucky) Public School System with one of their 2009 “Stars of Energy Efficiency” awards. The Warren County School System is a long-time user of NEED materials and training.

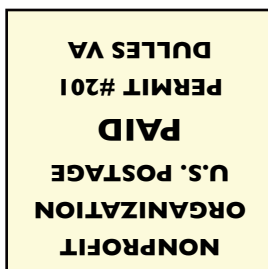
According to Kenny Stanfield, a principal with Sherman Carter Barnhart Architects in Louisville, the award is being given to Warren County for a number of energy-efficient buildings they have constructed over the years. Stanfield said that his firm has been working with them for almost 25 years, focusing on ways to improve the performance of their buildings to lower energy costs.

“Our success over the years,” he explained, “has come from reviewing each building we designed and then applying what we learned to the next one. For example, when we designed Albaton Elementary, we were able to reduce its energy use to less than half of what is used by a school that just meets the energy code, and we were then able to lower energy use even further for Plano Elementary School.”

Based upon their designs and the schools’ use of geothermal heating and cooling and other energy-efficient strategies, Warren County is now building what will become the nation’s first zero-energy public school.

“I think the real success of their program,” Stanfield added, “is that they tie the energy savings in with the classroom and make the school a learning tool. Every school in their system uses NEED curriculum materials as a basic teaching tool. This way, every school benefits from learning about energy savings. It’s been a great partnership that has helped our students become knowledgeable about all aspects of saving and using energy.”

Karen Reagor conducted NEED training programs for the school system in April that focused on starting student energy teams this fall. She will be following up with them in the coming months.



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