The Energy Learning Exchange (ELE) is a statewide public-private partnership of universities, community colleges, K-12 schools, companies, labor unions, and other public and private organizations working together to further Science, Technology, Engineering, and Mathematics (STEM) learning. The mission is to prepare students for career pathways in energy and provide Illinois companies with a superior energy workforce in the future. Illinois State University is the leading entity of the ELE through its Institute for Regulatory Policy Studies, Center for Renewable Energy, and Center for Mathematics, Science, and Technology.

**Careers In Energy Week**

ELE mailed Careers in Energy school kits to nearly 300 middle and high school teachers that had participated in energy education workshops through Illinois State University. Kits included Careers in Energy Week posters, an “Are you Ready to Get Into Energy?” flyer, a t-shirt for the teacher, pencil sharpeners and pencils for students, and a “Get Into Energy” notebook. Teachers were encouraged to visit www.Energy.IllinoisState.edu/careers/ to access resources for use in classrooms, including energy careers data, presentation files, videos, and curriculum links. On the site, teachers could request a speaker on an energy topic of their choice to present to their classrooms. Energy companies and organizations were contacted to help fill the speaker requests again this year. Emails were also sent by Illinois Pathways and other organizations to encourage teachers to visit the ELE website to utilize resources, order a kit, and schedule a speaker. This is our second year to participate in this event, part of a nationwide effort by the Center for Energy Workforce Development.

**Partnerships with the Industry**

ELE has brought together representatives from across the state to discuss future workforce needs at meetings, and industry members have served as judges and sponsors for student challenges. ELE also administers the Illinois Energy Workforce Consortium, comprised of utility companies and energy organizations in the state, and participates on the group’s task forces for Education and Career Awareness. Through the Consortium, Governor Pat Quinn declared October 13th to 19th as Careers in Energy Week in Illinois, and the ELE assisted the Consortium with mailing information packets regarding the week-long event to nearly 1,000 high school principals and administrators across the state including a Careers in Energy Week event poster, an “Explore Exciting Careers in Energy” information booklet, and an “Are You Ready to Get Into Energy?” flyer. Some of the companies and organizations have also planned additional activities, including speaking about careers in energy to classrooms, and hosting tours of their facilities.

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Dr. David Loomis (Institute for Regulatory Policy Studies and Center for Renewable Energy at Illinois State University), presented to students at Urbana Middle School for Careers in Energy Week. Students also participated in a hands-on activity using Kill-A-Watt meters to determine watts used in a variety of household appliances.

A student presents his energy project at the IL FFA Convention’s AgriScience Fair to judges Patrick Bullett (Exelon), Sherrie Gary (Ameren Illinois), and Dr. Willy Hunter (Center for Mathematics, Science, and Technology at Illinois State University), for a student challenge coordinated with the Agriculture Learning Exchange.
Next Generation Science Standards Curriculum

Teacher training workshops were held for middle and high school STEM teachers (science, technology, engineering, and mathematics). Funded through a grant from the Illinois School Board of Education (ISBE), the Illinois Mathematics and Science Partnership Program, Summer Workshop/Institute (WIP 5), focused on energy concepts and utilized Next Generation Science Standards (NGSS) in the context of career clusters as defined by Illinois Pathways.

The goal of the program was to develop instruction on energy-related lessons for students. Classes and field trips were designed to help teachers comprehend major principles of energy in Illinois as well as real-world applications. A two-week workshop was held in the summer of 2013 and again in 2014, with a number of one-day follow-up sessions and field trips including visiting the Nicor Gas Ancona Storage Center, Prairie State Generating Company, Exelon Clinton Power Station, Ameren Technology Applications Center/Substation, Danville Area Community College Wind Technician Program, Grand Ridge Energy Center, Solar House in Urbana, and Illinois State University to view the Solar Car, Wind Turbine, and Renewable Energy Lab. Participants also attended the Illinois Renewable Energy Conference and the Teachers in the Lead: New Illinois Learning Standards for Science Conference, both events hosted by Illinois State University in 2014.

Renewable Energy for Schools

Illinois Wind for Schools incorporates wind energy into classrooms with curriculum, instruction, design, and experimentation activities with data collection on school grounds. Lesson plans focus on energy and electricity, wind and weather, turbines and engineering, environmental considerations, and economics. To date, 15 schools have participated with training, curriculum and equipment at no charge to the schools thanks to grant funding provided by the Illinois Department of Commerce and Economic Opportunity. The team is a partnership of Illinois State University’s Center for Renewable Energy and College of Education, with Western Illinois University’s Illinois Institute for Rural Affairs and College of Business and Technology.

Illinois Solar for Schools was developed through the Center with funding provided by the Illinois Green Economy Network. Events were coordinated with five community colleges to recruit and select 13 middle and high schools, then materials and instructions were presented to teachers.

Renewable Energy for Schools is a new program being developed by the Illinois State University and Western Illinois University team to provide teachers with instruction for presenting a wide range of renewable energy curriculum in their classrooms.

Smart Grid for Schools

A Smart Grid for Schools program offers an opportunity for students to learn about new Smart Grid technology being rolled out by utility companies in the state. The program provides workshops for teachers, curriculum for their classrooms, and engages K-12 students with Smart Grid in a fun, hands-on way that incorporates Next Generation Science Standards. Schools can schedule to have an interactive display of simulated household rooms with electrical appliances and a Smart Grid meter for students to manipulate electrical usage to see how it affects the overall energy consumption in the house. Table top models also display an electric grid with smart grid functionality.

Energy in Illinois Outreach Efforts

The Energy Learning Exchange has exhibited at events throughout the state including the Illinois Science Education Conference, Science in the South, II FFA State Convention, STEMfest at Northern Illinois University, STEM 8th Grade Career Expo by the Bloomington Area Career Center, and STEM Night at Urbana School District 116.