“The KEEP Energy Education Program has changed my life. While I may have been required to make one Action Plan for this class, I do know that my eyes are now open to the possibility of creating future Action Plans on my own. By that I mean, my eyes are now continually open to the energy use in my school building and I will do what it takes to raise concern and advocate for change when it comes to our energy use.”  – NRES 634 Course Participant

Program Overview

Mission
The mission of KEEP is to initiate and facilitate the development, dissemination, implementation and evaluation of energy education programs within Wisconsin schools.

Goal
The goal of the program is to leverage teacher education to improve and increase energy literacy in Wisconsin’s K-12 schools as a means of contributing to statewide energy savings.

Vision
To be nationally recognized for creating an energy literate citizenry in Wisconsin actively engaged in energy conservation, efficiency and renewable energy initiatives.

Brief History
The Wisconsin K-12 Energy Education Program (KEEP) was created in 1995 to promote energy education in Wisconsin after the Wisconsin Center for Environmental Education (WCEE), located within the College of Natural Resources at the University of Wisconsin-Stevens Point, proposed that a comprehensive guide to K-12 energy education in Wisconsin be developed. KEEP is the product of an innovative partnership between educators and energy professionals. Initial funding from the Energy Center of Wisconsin (ECW) launched the project with support from the Wisconsin Environmental Education Board (WEEB) and UW-Stevens Point. As the initial project grew into a comprehensive program, Wisconsin’s Public Benefits Program, Focus on Energy, provided financial support which continued for 12 years (2000-2012). Since then, Wisconsin’s major utilities, in partnership with the ECW, the Wisconsin Environmental Education Foundation and Cool Choices, have ensured the continuation of KEEP, its programs and services to teachers and their students while enhancing its effectiveness.

KEEP has provided effective energy education for nearly 20 years making it one of the most successful statewide K-12 energy education programs in the nation and arguably the world.

KEEP’s programming aims to improve and increase energy literacy, as well as save energy in Wisconsin. KEEP accomplishes these objectives by:

• helping teachers integrate hands-on, standards-based, energy education into classrooms through professional development;
• bridging the divide between student learning that takes place at school and the implementation of energy-saving behaviors that result in savings impacts at home; and
• connecting the school to the surrounding community which enables students to assist their communities as they help residents manage their energy consumption and allows community resources to provide service experiences to students.

KEEP is the product of an innovative public private partnership between educators and energy professionals including Wisconsin’s major utilities. The University of Wisconsin-Stevens Point’s Wisconsin Center for Environmental Education — a center of the College of Natural Resources and UW-Extension - Cooperative Extension — launched this effort in 1995.

Front Cover: Newman Catholic High School students make adjustments before racing the solar car they designed and built as part of the 17th annual Wisconsin Public Service (WPS) Solar Olympics. KEEP staff judged student projects from 24 area high schools.
In 2014, KEEP continued to promote energy education to Wisconsin’s PK-12 education community, which includes teachers, administration, facilities personnel, support staff, students and their families, providing services, materials and opportunities to these audiences statewide. KEEP’s 2014 scope of work was developed through input from KEEP ad hoc instructors, WCEE staff, Wisconsin utility representatives and teachers who have participated in several KEEP courses.

**Areas of Focus**

KEEP’s scope of work is designed around three areas of focus that expanded programming efforts, including school, home and community initiatives.

**School-based initiatives** facilitate efficient and effective schools where students learn about energy and begin practicing good energy habits.

**Home-based initiatives** empower students, teachers and families to be ambassadors of good energy practices in their homes.

**Community efforts** aim to connect students, teachers and families to their community energy resources.

**Enrichment Pilot**

KEEP, in coordination with the Energy Center of Wisconsin (ECW) and Wisconsin utilities, conducted an enrichment pilot to help document energy savings of current KEEP activities. This pilot had three components:

- Measure the energy efficiency of the school building where KEEP has a presence;
- Collect data from teachers, students and their families regarding behavior changes and energy savings resulting from KEEP activities using the KEEP in Action online portal; and
- Partner with Cool Choices to offer an online behavior change game to schools that are part of the Green & Healthy Schools Wisconsin program.

**Green & Healthy Schools Wisconsin Partnership**

KEEP, as part of the Wisconsin Center for Environmental Education, is a collaborating partner of Green & Healthy Schools Wisconsin, along with the Wisconsin Department of Natural Resources and Wisconsin Department of Public Instruction. Green & Healthy Schools Wisconsin supports and encourages schools to create safe and healthy learning environments and prepares students to understand, analyze and address the major environmental and sustainability challenges now and into the future. It is a Web-based, self-paced, voluntary program available to all Wisconsin PK-12 public and private schools. To date there are more than 230 schools and school districts registered, with a reach of more than 100,000 enrolled students across the state. KEEP staff serve as focus area contacts and assist schools as needed with the energy and transportation sections of the Green & Healthy Schools Wisconsin application.
Inspiring Efficiency Award: KEEP was honored to receive the 2013 Inspiring Efficiency Education Award from the Midwest Energy Efficiency Alliance (MEEA) at the Awards Ceremony in Chicago on January 15.

Professional Development: Three hundred and thirty-two Wisconsin teachers participated in KEEP courses in 2014. With each teacher reaching an average of 60 students annually, the projected reach through this year’s courses is 19,920 Wisconsin students.

Energy Action Plans: Seventy-five educators developed 49 Energy Action Plans to contribute to energy savings within their schools, as a result of participating in six School Building Energy Efficiency Education courses. KEEP awarded $3,504 for the purchase of resources to support these plans.

2014 KEEP Enrichment Pilot Results:
- Energy Efficient Schools: Four schools received energy audits which identified 48 energy conservation measures that, if implemented, have a potential savings of 1,172,964 kWh and 36,543 therms.
- KEEP in Action: Through the online portal’s Appliance Survey, 144 teachers, students and KEEP course participants committed to taking 293 actions to reduce their energy use at school and home.
- Cool Choices: Through the online behavior change game, 29 percent of actions played by students, teachers and other school staff were energy-related, potentially saving over 530,000 kWh and 2,300 therms, if actions continue for one year.

ENERGY STAR® Appliance Upgrade Program: Six Family and Consumer Science (FCS) teachers were awarded funds for the purchase of new ENERGY STAR® qualified appliances to be used in the classroom as a teaching tool for energy efficiency and conservation.

STEM Education: KEEP partnered with Wausau and Rhinelander school districts to provide professional development for 19 teachers as part of their U.S. Department of Education’s Mathematics and Science Partnerships grant.

Energy Educator of the Year: Three energy educators were recognized at the Wisconsin Celebration of Excellence in Environmental Education awards banquet for their contributions to energy literacy across the state. Betsy Buckley, science teacher at Waunakee High School, and Karen Olson, science teacher at Baraboo High School, were awarded the Formal Energy Educators of the Year for their efforts facilitating an all-school sustainable transportation initiative at Waunakee High School. Together, they inspired 25 percent of the school’s staff and students to participate in a quarter-long competition to adopt more sustainable transportation habits. Melissa Rickert, Energy Manager and Sustainability Specialist at CESA 10, was awarded the Nonformal Energy Educator of the Year due to her work on energy management initiatives with 30 school districts across the state. She is also a KEEP ad hoc instructor having taught 19 School Building Energy Efficiency Education courses since 2008 inspiring 189 teachers and school staff to use their school building as a teaching tool.
School-based Initiatives

School-based initiatives facilitate efficient and effective schools where students learn about energy and begin practicing good energy habits.

Professional Development: KEEP offers ten unique graduate-level courses to Wisconsin PK-12 teachers through the University of Wisconsin-Stevens Point via face-to-face, online and hybrid course platforms. The courses are taught by 19 ad hoc instructors located throughout the state. In 2014, 26 courses were offered for 332 participants who received scholarships to offset the tuition costs. Forty-five percent of the scholarship funding was contributed by Wisconsin utilities.

KEEP held the following courses in 2014:

- NRES 610 Exploring Renewable Energy at the Energy Fair
- NRES 610 Exploring Building Science Technologies
- NRES 630 Energy Education in the Classroom
- NRES 631 Biomass Energy Education Online
- NRES 631 Exploring Energy Education through STEM*
- NRES 631 Wind Energy Education*
- NRES 632 Doable Renewables: Renewable Energy Education in the Classroom*
- NRES 633 Energy Education: Concepts and Practices Online
- NRES 634 School Building Energy Efficiency Education
- NRES 635 Renewable Energy Education Online

*Course available as a hybrid course

Pre- and Post-Course Surveys: Pre- and post-course surveys are administered for KEEP’s three primary face-to-face courses (NRES 630, NRES 632, NRES 634). The surveys help to identify what types of behavior change are initiated by participation in KEEP courses. Post-course surveys are sent six months after participating in a course.

2014 results (below) demonstrate an increase in how frequently participants engage in certain energy conservation behaviors and attitudes before and after taking a KEEP course:

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Increase in Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I leave a room, I turn off the lights</td>
<td>11%</td>
</tr>
<tr>
<td>I turn off the computer when it is not being used</td>
<td>11%</td>
</tr>
<tr>
<td>I buy energy-efficient appliances (ENERGY STAR® qualified)</td>
<td>9%</td>
</tr>
<tr>
<td>I am willing to buy fewer things to save energy</td>
<td>8%</td>
</tr>
<tr>
<td>Many of my everyday decisions are affected by my thoughts on energy use</td>
<td>6%</td>
</tr>
<tr>
<td>I buy energy-efficient light bulbs (CFLs or LEDs)</td>
<td>5%</td>
</tr>
</tbody>
</table>

Data from 42 teachers who participated in NRES 630 courses during 2013, 38 (90 percent) completed the pre-test, and 11 (29 percent) completed the post-test.
School-based Initiatives continued

School Building Energy Efficiency Education Course (NRES 634): Seventy-five Wisconsin teachers from 35 different schools participated in six course offerings.

Action Plans: Educators developed 49 course-required action plans implementing energy efficiency projects in their classroom, school building or school district. Examples of 2014 energy action plans include:

- Developing weekly activities for Energy Action Month (October), including classroom energy audits, awards for efficient classrooms and energy saving tips for home (Colby Elementary School, Colby);
- Family and Consumer Science students determining which appliances and preparation methods use the least amount of energy in an effort to reduce the kitchen lab’s overall energy consumption (Marshall High School, Marshall);
- Reinforcing energy efficient behaviors in the classroom and making the connection to home energy consumption and conservation practices (Marshall Early Learning Center, Marshall); and
- Creating student “green teams” to collect energy consumption data using watt meters, raise awareness of energy usage behaviors among staff and students, and reward efficient classrooms (Merrill Middle School, Oshkosh).

KEEP Enrichment Pilot – Energy Efficient Schools: KEEP staff assisted the Energy Center of Wisconsin to provide four schools with an energy audit. Each district received a comprehensive report, including energy modeling, recommended energy conservation measures and potential Focus on Energy incentives. Forty-eight individual measures were identified that, if implemented, have a potential savings of 1,172,964 kWh and 36,543 therms. These energy-saving opportunities were highlighted during KEEP’s School Building Energy Efficiency Education course offered in conjunction with the energy audits to guide teacher-created energy action plans.

- Glendale-River Hills School District: Parkway Elementary
- Milwaukee Public Schools: Golda Meir School Upper Campus, Milwaukee Environmental Sciences Charter School
- School District of Reedsburg: Westside Elementary

Mini-Grant Program: KEEP supported 51 course participants from 26 different schools with mini-grant funds (up to $100 per teacher) totaling $4,758. These funds help teachers implement course-required units and energy action plans in KEEP’s three primary face-to-face courses. Examples of 2014 mini-grant resource requests include:

- Watt meters and infrared thermometers to conduct classroom energy audits (Glendale-River Hills School District, Milwaukee Public Schools, Oshkosh Area School District);
- Smart power strips, LED and CFL desk lamps and vending misers to curb school energy consumption (Colby School District, Glendale-River Hills School District, Milwaukee Public Schools, Oregon School District, Oshkosh Area School District); and

Biomass Energy Education Online Course (NRES 631): The Biomass Energy Education online course was revised and offered for the sixth time. Seventy-four teachers have participated in this course since 2007. The course explains the various types of biomass using video, readings, discussion, quizzes and homework assignments. KEEP’s Biofutures Activity Guide is available online and contains classroom activities on biomass that help teachers take what they learned in the course and pass it on to their students.
Collaborative Professional Development: Through a special partnership with Facing the Future and Upham Woods Outdoor Learning Center, KEEP offered a modified Energy Education in the Classroom Course. Participants received both the KEEP Energy Education Activity Guide and Facing the Future’s Fueling the Future activity guide.

STEM Education: Through Science, Technology, Engineering and Mathematics (STEM), students and teachers explored, analyzed and discovered various energy concepts through hands-on, exploratory activities. KEEP strives to promote STEM initiatives throughout the state by offering assistance with various STEM events including:
- Peshtigo and Marinette STEM Days, reaching 400 students
- UW-Stevens Point STEM Exploration Day for Boys, reaching 300 students
- Green & Healthy Schools Wisconsin STEM workshop, for 17 educators
- Mathematics and Science Partnerships Grant, for 19 educators
- KEEP Exploring Energy Education through STEM course, for 10 teachers

Building Science Targeted Outreach Efforts: KEEP supported seven technology education instructors from six school districts to attend the Better Buildings: Better Business conference in Wisconsin Dells to gain knowledge on the latest and greatest practices in the Building Science field.

Lake Mills Elementary School: KEEP staff co-conducted a workshop with Miron Construction for Lake Mills Elementary School staff to facilitate development of 10-hours of environmental education curriculum for K-4 based on the high-performing features of the LEED v4 certified building.

 Milwaukee Environmental Sciences Charter School: KEEP provided resources and activities for teachers to assist in the implementation of a seven-week Energy Expedition which involved all 150 students (grades K-5). Some students developed documentation panels that demonstrate their understanding between energy and simple machines. Other students conducted a whole-school energy audit and presented their findings and recommended efficiency improvements.

KEEP Enrichment Pilot - Cool Choices: Through a partnership with Cool Choices, 33 Green & Healthy Schools engaged 862 students, teachers and other school staff in the Cool Choices online behavior change game. Players recorded 28,718 actions that relate directly to the Green & Healthy Schools Wisconsin application focus areas and contributed to reduced environmental impacts and costs, improved health and wellness, and increased environmental and sustainability literacy. Specifically related to energy, more than 8,200 actions (29 percent) were taken potentially saving more than 530,000 kWh and more than 2,300 therms, if actions continue for one year.

“From an educator’s standpoint, gleaning information for my [classroom] presentations from a conference like this not designed for educators but for tradespeople, adds instant validity/confidence to the subject matter.” - Better Buildings: Better Business Conference Participant
Home-based initiatives empower students, teachers and families to be ambassadors of good energy practices in their homes.

**KEEP Enrichment Pilot - KEEP in Action:** Through the KEEP in Action online portal, classroom teachers and their students, as well as KEEP course participants, completed KEEP’s Appliance Survey. By focusing on frequently used appliances and electronics, the survey helps participants gain a better understanding of their energy consumption and behaviors, and guides them to take action to reduce their consumption. There were 144 participants in this survey who committed to 295 actions to reduce their energy consumption at school and home. Actions included: using the appliance less often, limiting its use to “off-peak” hours, and turning off or unplugging the appliance when not in use.

**ENERGY STAR® Appliance Upgrade Program:** Six Family and Consumer Science (FCS) teachers were awarded up to $900 each towards the purchase of new ENERGY STAR® qualified appliances to upgrade inefficient classroom models. Awardees also received two Kill-a-Watt meters and refrigerator/freezer and hot water temperature cards, all of which enhance classroom lessons on energy and support the FCS motto of Creating Healthy and Sustainable Families. Upgraded appliances included three washing machines, two refrigerators and one upright freezer.

**Energy Saving Ideas and Actions:** “Energy Saving Ideas and Actions for Home or School,” a new course requirement added to KEEP’s three primary face-to-face courses (NRES 630, NRES 632, NRES 634), asks participants to reflect on and report personal changes to save energy as a result of taking the course and how and when they will make these changes.

“By taking the Doable Renewables Course, I was able to explore and create a unit on ‘Off the Grid Earth Homes Design & Construction.’ After sharing this information with my wife, we are considering building an Off-Grid Earth Home for our retirement home. Great class!” – NRES 632 Course Participant

**Graduate Student Jenny Christopher**

UW-Stevens Point graduate student in Environmental Education and Interpretation, Jenny Christopher, started as KEEP’s graduate assistant in August. Jenny comes to Wisconsin from California where she worked as a Marketing Manager for Environmental Business International. Jenny is aligning KEEP activities to Common Core State Standards and the Next Generation Science Standards. Her research will focus on the relationship between perceived collective efficacy and potential environmental behavior change within the context of a new KEEP school to home energy education activity using hands-on investigational tools to engage students.
Community Efforts

Community efforts aim to connect students, teachers and families to their community energy resources.

**Boys & Girls Club of Portage County:** KEEP partnered with the Boys & Girls Club of Portage County to determine best practices for integrating energy-themed activities into their after-school programming, helping them to fulfill STEM requirements for a grant they received from Cellcom. Work will continue in 2015 to incorporate energy audit activities into their secondary programming.

**Constellation E2 Energy to Educate Grant:** In support of a Mid-State Technical College (MSTC) Constellation E2 Energy to Educate grant, KEEP offered a Doable Renewables: Renewable Energy Education in the Classroom course to ten teachers from four Central Wisconsin area high schools. MSTC faculty and students provided targeted training for career and technical education (CTE) students, including installation of a two kW photovoltaic system at each high school.

**Annual Energy Fair, Custer:** KEEP staff helped organize the Educator Tents at the Midwest Renewable Energy Association’s annual Energy Fair, including hands-on workshops, classroom resources and networking opportunities. Resources and a networking social highlighted the Green & Healthy Schools Wisconsin program. KEEP provided 20 teacher scholarships for continuing education credit through the WCEE’s Exploring Renewable Energy and Sustainable Living at the Energy Fair course. Attendance included 926 visits to the Educator Resources Tent and 406 attendees at sessions in the Educator Workshops Tent.

**Energy Action Month:** To celebrate Energy Action Month in October, KEEP encouraged Wisconsin residents to record energy pledge videos and share them via KEEP’s SchoolTube Channel. More than 75 UW-Stevens Point faculty, staff and students participated, including students at Campus Sustainability Day, Chancellor’s Cabinet members, WCEE staff and Watson Hall residents.

**Careers in Energy Week:** As part of Energy Action Month, KEEP’s energy-related career activities were shared through Careers in Energy Week (October 13-19) materials. KEEP worked with the Wisconsin Energy Workforce Consortium to raise awareness about energy careers to Wisconsin PK-12 students.

**Milwaukee Area Energy Educator Network:** KEEP staff convened a group of Milwaukee area industry professionals and educators to discuss K-12 energy literacy efforts in the greater Milwaukee area. The group plans to meet quarterly and offer networking socials and field trips to area educators as part of its energy education efforts.

**National Energy Literacy Virtual Town Hall:** KEEP staff highlighted energy education successes in Wisconsin during the U.S. Department of Energy’s National Energy Literacy Virtual Town Hall webcast, reaching more than 200 individuals from across the country.
Curriculum Guides: KEEP curriculum guides were distributed to 200 educators participating in KEEP graduate-level courses through UW-Stevens Point and included the KEEP Energy Education Activity Guide, Doable Renewables and Energy and Your School.

Hands-on Resources: Several hands-on energy education resources are available for check-out through the Wisconsin Center for Environmental Education’s Resource Library. A new hand-crank generator, which allows comparison of energy consumption between incandescent, CFL and LED light bulbs, was purchased this year. A partnership with Keep Greater Milwaukee Beautiful (KGMB) provided more than 1,000 students and the general public in the Milwaukee area experiences with the Pedal Power energy bike, which KEEP provided to KGMB in 2014. An additional Pedal Power also resides at Conserve School in Land O’Lakes which enables their students to develop energy literacy skills.

New Energy Audit Kit: KEEP developed a School to Home Energy Investigation Kit that includes professional technological tools to perform simple energy assessments and behavior investigations in the classroom and at home. Student worksheets and teacher support materials provide direction for up to three class periods and one take home assignment, targeted toward grades 6-8. KEEP’s graduate assistant will be collecting behavior change data from these kits for her thesis research.

Online Resources: Online resources are available through KEEP’s website, which received more than 300,000 visits in 2014. Teachers can access various activities from the KEEP curriculum guides, sign-up for KEEP’s online newsletter (KEEP Going Online), or have their students participate in an online appliance survey or energy scavenger hunt.

Trunks and Kits Lending Program for Educators

The Wisconsin Environmental Education Resources Library collection contains more than 6,000 environmental and sustainability education materials, including an amazing array of hands-on educational trunks and kits.

The Energy Education Trunk (pictured) contains materials for five popular KEEP activities as well as energy education DVDs and hands-on resources for grades 5-7.
The KEEP budget below covers a 12-month period (January 1, 2014 to December 31, 2014). KEEP’s base funding comes from a partnership between the Wisconsin Utilities and the Energy Center of Wisconsin. The University of Wisconsin-Stevens Point and the Wisconsin Center for Environmental Education provide in-kind support for the program. Additional funds are generated through grants, contracts and program revenue through Cool Choices, the Wisconsin Environmental Education Foundation and other partnerships.

$150,742
$401,482
$55,241

Utilities
Grants
In-Kind Support UW-Stevens Point

KEEP would like to thank our partners from the past 12 months:

Alliant Energy
Adult Role Models in Science, UW-Madison WISCIENCE
Boys & Girls Club of Portage County
Cooperative Educational Service Agency (CESA) 10
Cool Choices
Energy Center of Wisconsin
Facing the Future
Focus on Energy
Green & Healthy Schools Wisconsin
Into the Outdoors Education Network
KidWind
Jean and David Lane Energy Education Scholarship Fund
LEAF – Wisconsin’s K-12 Forestry Education Program
Madison Gas and Electric
Midwest Renewable Energy Association
Mid-State Technical College
Northwest Advanced Renewables Alliance

School District of Rhinelander
Upham Woods Outdoor Learning Center
University of Wisconsin–Stevens Point
UW-Stevens Point College of Natural Resources
UW-Extension — Cooperative Extension
Wausau School District
Wisconsin Association for Environmental Education
We Energies
Wisconsin Center for Environmental Education
Wisconsin Department of Natural Resources
Wisconsin Department of Public Instruction
Wisconsin Environmental Education Board
Wisconsin Environmental Education Foundation
Wisconsin Green Building Alliance
Wisconsin Public Service
WPPI Energy Wisconsin Member Utilities
Xcel Energy
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Wisconsin K-12 Energy Education Program (KEEP)
College of Natural Resources
University of Wisconsin-Stevens Point

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