

# Energy Education for a Sustainable Future

## A Case Study of the Wisconsin K-12 Energy Education Program (KEEP)

by Wisconsin K-12 Energy Education Program (KEEP)

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## Overview

This case study will provide evidence, examples, and lessons learned in tackling the “wicked problem” of energy use via the Wisconsin K-12 Energy Education Program (KEEP). Established in 1995 to address the need for increasing energy literacy in schools, KEEP has successfully reached thousands of teachers throughout the state with its graduate-level courses and high quality materials. These resources have helped increase the quality and quantity of energy education for hundreds of thousands of kindergarten through 12th grade (K-12) students in Wisconsin. KEEP serves as an example of a sustained environmental education program within the formal (school-based) education system. It was designed with input from energy professionals and educators, followed best practices for curriculum development, continues to have strong public and private support, and draws on both environmental education and environmental psychology theories in order to have a lasting impact on energy literacy and energy use in Wisconsin.

### **Wicked Problem: Addressing Energy Use through Energy Literacy**

Impacts of climate change on people and the environment can be found around the world and are expected to worsen as the warming of the Earth continues. Because energy-related carbon dioxide emissions are the largest component of all U.S. greenhouse gas emissions (U.S. EIA, 2011), using less energy and being more efficient with energy use are two key ways human activity can contribute to climate change solutions. Today, there is more access to energy efficient appliances and technologies, an increase of implementation of energy policies by governments, and a growth in global agreements to reduce climate change, yet emissions continue to increase steadily, at an average rate of 1.3 percent per year between 1970 and 2010 (IPCC, 2013).

The statistics tell us that “U.S. households account for about 38 percent of national carbon emissions through their direct actions, a level of emissions greater than that of any other country except China and larger than the entire U.S. industrial sector” (Gardner & Stern, 2008). Since 1990, emissions related to electricity use have risen by 2.4% annually, and those related to gas use have increased by 0.9% each year (U.S. DOE, 2005). Energy costs comprise the second largest expense after personnel on kindergarten through 12th grade (K-12) school district operating budgets, totaling more than \$7.5 billion annually (U.S. EPA, 2008). While energy use statistics can be overwhelming, simple changes can be done to address the wicked problem of energy use. Within local government operations, the U.S. Environmental Protection Agency estimates that if each government, school building, and business building owner improves energy efficiency by 10% or more, within seven years Americans would save about \$10 billion and

reduce greenhouse gas emissions by more than 20 million metric tons of carbon equivalent, equal to the emissions from 15 million vehicles (U.S. EPA, 2011).

Human behavior as it relates to energy use can contribute to the solutions of addressing global climate change. Exploration into what is known about pro-environmental behaviors in the field of environmental psychology can provide direction for the development of energy education programming that focuses on changing patterns of behavior at home and school to effectively reduce energy consumption. Research shows that combining behavioral programs with effective energy efficient technology has a potential to save as much as 20% of total U.S. residential energy consumption (Frankel, Heck & Tai, 2013), and within K-12 schools, behavioral and operational measures alone can achieve energy cost savings of up to 25% (U.S. EPA, 2008).

With growing concerns about climate change and overuse of non-renewable energy resources, the need for energy education is growing as well. However, neither the need nor the recognition of that need is new. A survey titled “Energy: Knowledge and Attitudes” conducted in the United States by the National Assessment of Educational Progress in 1978 revealed that American students were very poorly informed about energy. However, 95% of young adults surveyed reported that they wanted more information about energy and believed that energy should be a part of every school’s curriculum (Holmes, 1978). Twenty-four years later the report “Americans’ Low ‘Energy IQ:’ A Risk to Our Energy Future” published by the National Environmental Education & Training Foundation and Roper ASW revealed that just 12% of Americans can pass a basic quiz on energy literacy and stated that Americans tend to “overestimate their energy knowledge.” On the other hand, Americans tend to have a strong desire for reducing personal energy consumption, and a correlation was made linking a person’s knowledge level about energy to the frequency of actions taken to reduce energy (NEETF, 2002).

Since a major goal of environmental education is to create new patterns of behavior in individuals, groups and society in relation to the environment (UNESCO, 1978), using an educational platform to encourage pro-environmental behaviors offers an applied setting that would help decrease global carbon emissions. Although there is much work still to be done in developing an energy literate citizenry, good progress has been made in kindergarten through 12th grade (K-12) schools in Wisconsin through the Wisconsin K-12 Energy Education Program (KEEP). This case study will provide evidence, examples, and lessons learned in tackling the “wicked problem” of energy use through effective teacher professional development via KEEP. A background will explain KEEP’s strategic development model involving three essential components: (1) secure base funding and strategic partnerships, (2) build a robust conceptual framework to guide curriculum and professional development, and (3) conduct ongoing evaluation and assessment strategies. Additionally, program areas specifically addressing environmental education, environmental governance, and environmental psychology will be discussed as potential areas for other environmental education organizations to adapt and integrate.

# Approach

## **About Wisconsin K-12 Energy Education Program (KEEP)**

Located in the Midwest of the United States bordered by two of the Great Lakes, Michigan and Superior, Wisconsin, is the size of a small country covering 65,556 square miles (1.7 million square kilometers). With a population of approximately 5.8 million, it is estimated that about one in six people work or learn in a K-12 school across the state. There are 3,000 K-12 schools (private and public) and 424 public school districts.

The impetus for creating an energy education program in Wisconsin began in the early 1990s. In 1994, the [Wisconsin Center for Environmental Education](#) completed statewide environmental literacy surveys of Wisconsin students, teachers and administrators. Key findings of the final assessment, "[Are We Walking the Talk,](#)" revealed:

1. Students' knowledge of important ecological concepts and environmental issues was lacking,
2. Teachers indicated the need for additional professional development and support materials, and
3. Professional development courses taken served as a good predictor for the amount of class time a teacher devoted to teaching about the environment (Champeau et al., 1997).

These conclusions motivated the Center to seek and secure funding to create an energy education program for teacher professional development. Through initial funding from Seventhwave (formerly Energy Center of Wisconsin), a nonprofit energy efficiency research organization based in Madison, Wisconsin, the [Wisconsin K-12 Energy Education Program \(KEEP\)](#) was created in 1995.

***The mission of KEEP is to initiate and facilitate the development, dissemination, implementation, and evaluation of energy education programs within Wisconsin's K-12 schools.***

In the early years, Seventhwave initiated a baseline study to extend the previous research done by the Wisconsin Center for Environmental Education. The study found that students lacked the knowledge characteristic of energy literacy. For example, of students in seventh through 12th grades, just over half (53 percent) knew the sun was the source of energy on Earth and well under half (38 percent) acknowledged that conservation was a solution to energy shortages. The study also assessed teachers' perceived competencies in teaching about energy; it found that only 12 percent of the respondents indicated that they were competent in energy education. In fact, of the teachers who completed the survey, 49 percent indicated lack of background knowledge was the number one reason why teachers do not include energy topics in their classroom teaching. Limited class time and meager resources were also popular answers (47 percent and 37 percent respectively) (Hagler Bailly, 1999).

This research provided the evidence-based justification that the energy community needed to launch and continue supporting efforts of KEEP now for over 20 years.

***The goal of KEEP 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.***

The 2014 KEEP Annual Report provides more information discussing the core foundations of KEEP<sup>1</sup>.

### **Robust Conceptual Framework Guiding Curriculum and Professional Development**

The United States has made progress outlining the knowledge and skills to help students and the public make informed energy decisions. In 2006, [\*Climate Literacy: The Essential Principles of Climate Science\*](#) was published by the U.S. Global Change Research Program, and in 2010, the U.S. Department of Energy published [\*Energy Literacy: Essential Principles and Fundamental Concepts for Energy Education\*](#). National and statewide energy education programs such as the [National Energy Education Development \(NEED\) Project](#) and the [Ohio Energy Project](#) put these energy and climate concepts into practice through K-12 curriculum, support materials and training for teachers and students.

View an introduction to energy literacy from the U.S. Department of Energy online<sup>2</sup>.

A comparable framework, strategically developed over the first two years of KEEP's implementation, forms the basis of a logically sequenced, comprehensive education about energy for Wisconsin students. [\*A Conceptual Guide to K-12 Energy Education in Wisconsin\*](#) (2003, 2nd ed.) contains nearly 60 concepts, (including concepts specific to Wisconsin's energy issues), is organized under four themes (We Need Energy, Developing Energy Resources, Effects of Energy Resource Development, and Managing Energy Resource Use), and is sequenced to show when (grade level) and where (subject area) the concepts could be incorporated into a curriculum. Representatives from various energy and education fields were involved with the development process.

Over time, KEEP staff and stakeholders recognized a need to provide additional comprehensive curriculum frameworks in the evolving field of sustainable energy. Developed with input from teams of topical experts, these frameworks also guide lesson development and provide assistance with linking these challenging topics to various subject-areas and content standards.

[\*Renewable Energy in Building Science Conceptual Framework\*](#) (2010)

[\*Climate Change Conceptual Framework\*](#) (2011)

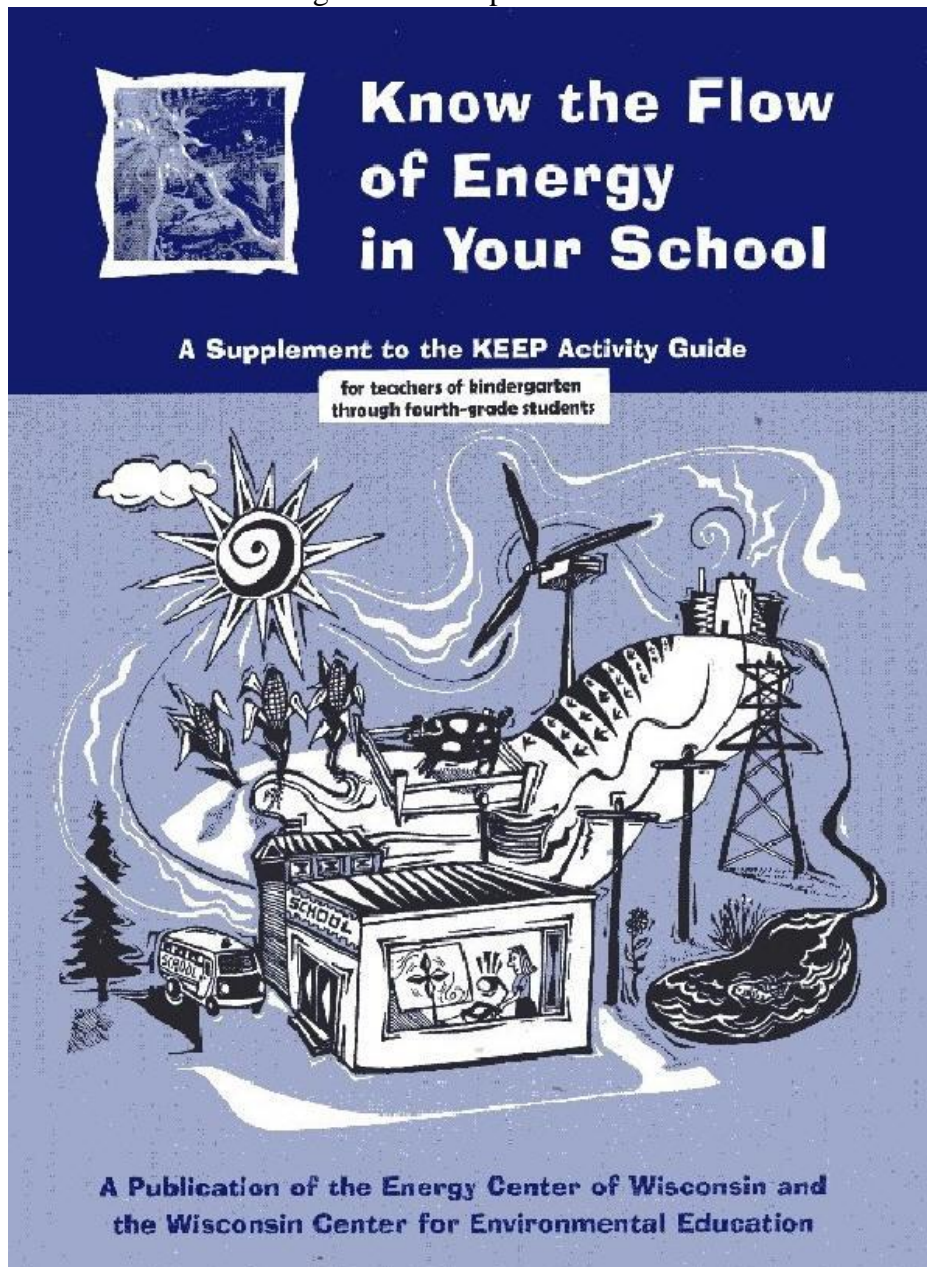
[\*Sustainable Transportation Conceptual Framework\*](#) (2011)

### **KEEP Curricula**

*A Conceptual Guide to K-12 Energy Education in Wisconsin* has directed the development of six Wisconsin-based activity guides. Ninety-five hands-on activities, divided among the four KEEP themes, provide K-12 teachers in a variety of subject areas with support materials, assessment options, extensions, and resources designed to promote energy literacy in Wisconsin students. The interdisciplinary lessons are aligned with [Wisconsin's Academic Standards](#), the [Common](#)

[Core State Standards](#), and the [Next Generation Science Standards](#). Each KEEP activity guide can be completed as a comprehensive unit or activities conducted separately.

A review of curriculum guides developed can be found online<sup>3</sup>.



### KEEP Professional Development

To further support teacher efforts to integrate energy education into the curriculum, over [10 teacher professional development courses](#) accredited through the University of Wisconsin-Stevens Point have been created since 1997 to deepen the integration of the energy education concepts. The main vehicle for dissemination of KEEP activity guides, these courses provide K-12 teachers fundamental knowledge about energy concepts, orientation to the relevant activity

guide, and the opportunity to integrate lessons into their curriculum through peer teaching and development of unit and action plans. Face-to-face and online courses often include guest speakers, field trips and home activities that help connect teachers to local energy issues. Web-based course support pages provide additional course materials and resources available to participants after completion.

***On average 29 KEEP courses are offered every year and around 350 teachers participate annually.***

To carry out this course load, KEEP staff select educators and energy resource professionals experienced in teacher education to be trained and serve as adjunct instructors throughout the state. These instructors are instrumental in helping KEEP staff design, develop and revise courses and activity guides, and are the key to the success of KEEP courses and maintaining a network of teachers and schools. To-date over 40 instructors have been trained and 12, on average, participate in annual refresher training workshops to maintain active teaching status.

Some KEEP courses go beyond teaching fundamental energy concepts and providing curriculum guides.

***KEEP's School Building Energy Efficiency Education course focuses on raising awareness of energy use in school buildings and guiding K-12 staff towards utilizing the school building as a teaching tool.***

The course brings together teachers with energy professionals, such as school district building managers and representatives from their local utility and statewide energy efficiency programs, who conduct a walk-through school building energy audit during the course, provide information tailored for classroom application of energy management practices, and emphasize sustainable behavior change. As the final assignment, teachers develop action plans outlining how they and their students will help save energy and money in their school buildings.



[Uwsp](#)

One course participant shared their new awareness of energy use:

***“As a result of KEEP’s ‘NRES 634 School Building Energy Efficiency Education’ course I have a new awareness of how much energy is used in my classroom, building and school district, so much that I have modified my classroom practices to reflect energy saving behaviors. Having learned how to calculate the cost of energy use per kilowatt hour (kWh) has encouraged me to reflect on some of my wasteful energy practices, such as leaving my classroom lights on when unoccupied, allowing unused appliances to remain in a charging state for prolonged periods of time, and using excessive lighting in lieu of opening blinds and curtains during daylight hours. Having had the opportunity to create an ‘Energy Action Plan’ has helped me to focus on energy saving practices, as well as encourage my students and peers to participate in energy saving behaviors.”***

By KEEP’s 18th year of offering courses, over 6,000 teachers have participated and have potentially taught over three million students. To date, 388 teachers have returned to KEEP receiving over 50 hours of energy education instruction through participation in at least three courses. KEEP recognizes and celebrates these teachers as “KEEPtacular” for their strong interest and commitment to energy literacy.

# Outcomes

## Ongoing Evaluation and Assessment Strategies

KEEP conducts several types of evaluation of their teacher professional development courses to assess effectiveness and adapt to shifts in the energy and education climate (Lane, Mollica, & Windjue, 2013). Course evaluations are compiled on a regular basis and discussed at annual meetings with adjunct instructors to improve the quality of content and instruction. More recently, pre-post course surveys have been designed to assess professional development usefulness and application. Graduate students have performed [research](#) to guide course and curriculum development. To assess changes in teachers' energy use behaviors and the role KEEP plays in decreasing school energy use, course assignments are analyzed and teacher behavior surveys are periodically conducted. Below is a summary of the results from several studies with current and former course participants.

## Pre-Post Course Surveys

To assess the impact of KEEP's energy education courses, each course participant receives a pre-course survey 1-2 weeks prior to a course starting. A post-course survey is then sent 6 months after the course. The assessment began in 2013 and includes data from three KEEP courses: *Energy Education in the Classroom*; *Renewable Energy Education in the Classroom*; and *School Building Energy Efficiency Education*. A comparison of 2013-2014 pre-post course survey responses revealed significant positive changes in views on energy conservation and education. Additionally, more respondents taught about energy after taking a KEEP course than before, and most have either used or plan to use a KEEP activity guide. When asked how often they engaged in energy conservation behaviors and thought processes, results show a statistically significant increase in these behaviors after participating in a KEEP course (KEEP, 2014 ).

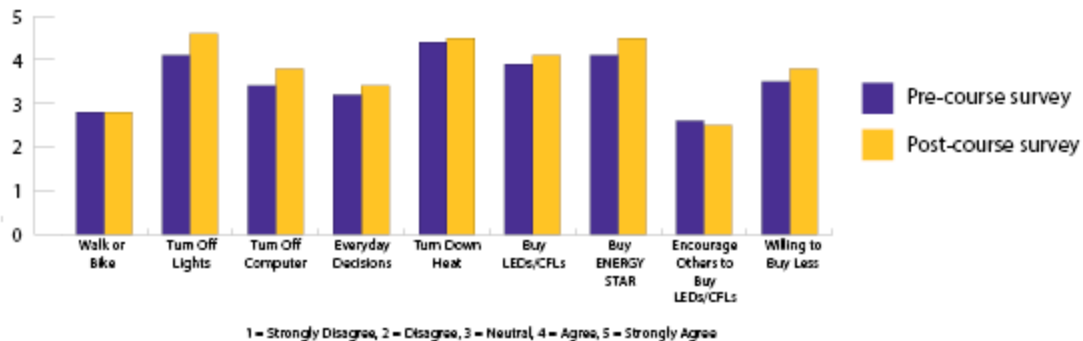


## Impacts and Behavior Changes of Energy Education

The Wisconsin K-12 Energy Education Program (KEEP) has been offering professional development courses for K-12 teachers since 1997. By the end of 2014, more than 6,000 teachers had participated in KEEP courses. To document the impact that our courses have on participants, we implemented a pre- and post-course survey of our three main face-to-face courses (NRES 630, 632, and 634) starting in 2013. The goal was to determine whether course participants' beliefs and behaviors related to their teaching about energy in the classroom and their own personal consumption of energy both at home and school are impacted by KEEP. The pre-course survey is completed before they participate in the course and the post-course survey is sent out and voluntarily completed six months after the course. Below is a snapshot of the impacts of three of KEEP's courses.

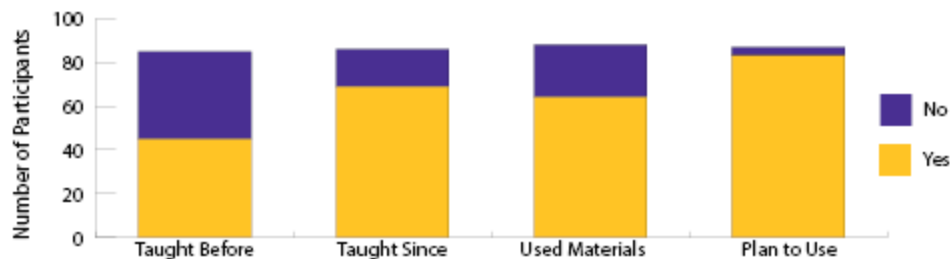
### Changes in Personal Energy Conservation Behaviors

Participants in NRES 630 Energy Education in the Classroom were asked to indicate how frequently they engaged in certain energy conservation behaviors and thought processes. Results show a significant increase in participants' personal energy conservation behaviors post-course, such as turning off the lights when leaving a room or purchasing ENERGY STAR® appliances.



### Changes in Energy-Related Teaching Practices

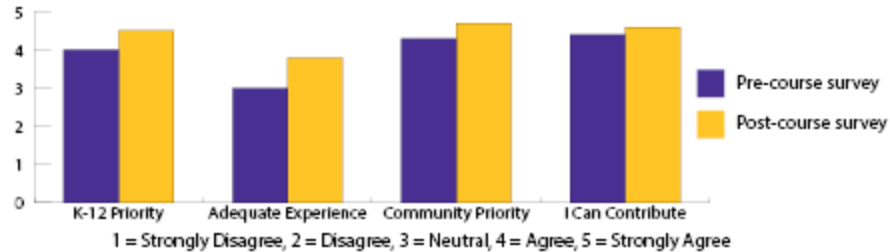
A large majority of participants in any of the three courses reported teaching about energy after taking a KEEP course and most plan to use the materials and resources provided by the courses Energy Education in the Classroom, School Building Energy Efficiency Education and Doable Renewables.



### Changes in Views on Energy Conservation

Participants in NRES 630 Energy Education in the Classroom and NRES 634 School Building Energy Efficiency Education were asked whether they believe energy education should be considered a priority in our K-12 education system, have adequate experience to teach about energy, believe saving energy should be a priority in their community, and can contribute to solving energy problems by making appropriate energy-related choices and actions.

Results showed a statistically significant increase in agreement with each of the statements post-course, indicating that participants considered energy education and conservation a higher priority and felt more confident in their ability to take action.



Beginning in 2015, the surveys for all three courses have been re-designed to ask many of the same behavior-related questions in each course, with just a few questions being specific to a particular course.

For a copy of the full 2013-2014 Pre/Post-Course Survey Report, please email [jmollica@uwsp.edu](mailto:jmollica@uwsp.edu).



Wisconsin K-12 Energy Education Program (KEEP)  
College of Natural Resources  
University of Wisconsin - Stevens Point

20 Years of Energy Education  
1995-2015

### KEEP Alumni Survey

In a survey conducted by Seventhwave in 2014, teachers who had taken KEEP courses in the five years prior (i.e. KEEP alumni) gave high marks to KEEP for helping them increase student knowledge and understanding about various aspects of energy. The respondents indicated that as a result of KEEP they have integrated energy efficiency into a myriad of subject matters, and mentioned a wide variety of innovative teaching methodologies adopted as a result of the KEEP curriculum. The results of the survey show not only that KEEP alumni actively teach energy education, but also that they found KEEP's resources and courses to be a helpful resource in doing so (La Haise, 2014).

Comments from a KEEP alumnus demonstrate the information learned by taking a course reaches farther than just the classroom.

***“I absolutely enjoyed taking this course. It was an invaluable resource for my school, as well as my home. I have discussed this course so much that colleagues are considering taking future courses. I definitely plan to expand my knowledge base by taking additional courses. I love how I am still receiving information even though the course is over. It keeps me cognizant that resources are available and the KEEP staff is genuinely concerned about energy conservation.”***

Read more examples of what teachers say about KEEP professional development online<sup>4</sup>.



### Teacher Energy Use Survey

In 2011, the Wisconsin Center for Environmental Education surveyed 5,110 Wisconsin teachers regarding energy use practices in school and at home. More than 500 teachers responded (10 percent response rate); of which 302 teachers indicated they had some experience with KEEP. Results found that 96 percent of respondents reported they completely turn off their classroom lights always or most of the time. Interestingly 74 percent of respondents reported always or almost always turning off their computer monitors while not in use at home, but only 31 percent reported the same behavior at school. Of respondents who indicated some experience with KEEP, 13 percent reported having a [Home Performance with ENERGY STAR](#) evaluation, while

only 8 percent of teachers who had not had experience with KEEP reported having their homes audited (WCEE, 2011).

### Self-reported Behavior Change

Starting in 2014, KEEP added a self-reported behavior change component course requirement to all face-to-face KEEP courses. Participants are now asked to report personal changes they plan to make to save energy as a result of taking the course including when they will make these changes and how. Analysis of 2014-2015 data revealed that many KEEP course participants plan to engage in curtailment actions at home such as turning off lights, and unplugging or shutting off appliances and electronics. Although, not as frequent as plans for home energy conservation (reported by 81 percent of students), energy savings in schools were planned by over half (58 percent) of the participants as well (KEEP, 2015).

As an example, read one teacher's personal outcome:

***“I have considered myself to be a fairly energy-conscious individual before taking this class. I make sure to turn off lights when I’m not using them, I have a programmable thermostat in each level of our tri-level house, and I keep the water heater set to a reasonable temperature. Having been through the class, I see how much more I can do to save energy. My home computer is now turned off at night. I have purchased the low-wattage light bulb packs from Costco. I have signed up for an energy audit from We Energies. More importantly, thanks to the class I have some data to show my husband to sway his energy habits. I was able to use the energy meter to show how leaving a T.V. on wastes energy and money. I am now aware of the rebate and grant money available for those who make smarter choices in the purchase of appliances. My children are quick to pick up my new habits, which hopefully will start to show up on our bill, but also makes me happy to think of the magnification of responsible energy consumption.”***



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### Quantifying Energy Savings

Tracking actual energy savings in kilowatts or therms, especially by students of the teachers who participated in the KEEP courses, is harder than recording planned actions. Participation by teachers in a KEEP course is often only one part of a school-wide initiative to save energy and save money. Whether changes are tied directly to KEEP or not, some schools in Wisconsin are making great strides toward increased energy literacy and decreased energy use. For example, energy education and behavior change approaches utilized by Marshall Public Schools, in Dane County, Wisconsin, were partially responsible for a 26 percent reduction in energy use in 2013-2014 alongside energy management services provided by [CESA 10](#). After completing the KEEP course in 2014, nine Marshall teachers implemented energy action plans in their school buildings ranging from a performance by [Madison Gas and Electric's MaGicEnergy](#) storyteller for elementary-aged students to engaging high school Family and Consumer Science students to measure energy usage of appliances and preparation methods in the kitchen lab.

Read more about Wisconsin school districts improving energy efficiency gains through education<sup>[5](#),[6](#)</sup>.

# Disciplinary Connections: Environmental Education, Environmental Governance, and Environmental Psychology

## Environmental Education

KEEP was built upon the foundation and long legacy of environmental education through a supported legislative process in Wisconsin dating back to 1928 with the establishment of the first [school forests](#). Seven years later, state legislation passed the Wisconsin Conservation Education Statute (1935) establishing the requirement of teacher certification programs to provide “adequate instruction in conservation of natural resources” to certify science or social studies teachers and for the conservation of natural resources to be taught in all public elementary and high schools. In 1969 an even greater commitment to environmental education was made through the Wisconsin Department of Public Instruction by creating a full-time [Supervisor of Environmental Education](#), which currently exists today.

As the environmental movement grew worldwide, Wisconsin strengthened the commitment to environmental education through leaders like U.S. Senator Gaylord Nelson from Wisconsin who declared the first Earth Day on April 22, 1970, and movements such as the passing of the Environmental Education Act in the United States the same year. These actions helped establish the [Wisconsin Association for Environmental Education](#), which grew out of the Wisconsin Council for Conservation Education, as the professional organization for environmental educators. Documents like “[A Guide to Curriculum Planning in Environmental Education](#)” (Engleson & Yockers, 1985) were developed through the principles outlined in the [Tbilisi Declaration](#) of 1977.

In 1985, Wisconsin legislature enacted a statute requiring school districts to develop and implement a K-12 curriculum plan; which led to additional legislated statues creating the [Wisconsin Environmental Education Board](#) and [Wisconsin Center for Environmental Education](#) in 1990.

By the time of KEEP's establishment in 1995, several national models like [Project WET](#), [Project WILD](#), and [Project Learning Tree](#) were well established in environmental education curriculum design in the United States. The [Guidelines for Excellence](#) series created by the North American Association for Environmental Education provided the resources to help with the curriculum design. Following national environmental education models and aligning to the established [Wisconsin Model Academic Standards in Environmental Education](#) (DPI, 1998), KEEP designed a curriculum and teacher professional development model to advance energy literacy through students and teachers to ultimately promote positive energy use behaviors for all the people of Wisconsin.

For a full history of Environmental Education in Wisconsin, please visit [EEinWisconsin.org](http://EEinWisconsin.org)<sup>7</sup>.

For a timeline of environmental education worldwide and more background on the foundations of environmental education see “Foundations of Environmental Education” in [Across the Spectrum: Resources for Environmental Educators](#) (Monroe & Krasny, 2015)<sup>8</sup>.

## Environmental Governance

The foundation of KEEP is based on a more “formal education” strategic governance structure created under the state legislature as explained in the previous section. The program uses the five tenets of environmental education outlined in the Tbilisi Declaration of 1977 (awareness, knowledge, attitudes, skills, and participation) as the basis for program design.

KEEP’s funding model is an innovative public-private partnership between educators, a university, and energy professionals. Initial funding came from Seventhwave with additional financial support from the Wisconsin Environmental Education Board and the [University of Wisconsin-Stevens Point](#). In 2000, Seventhwave worked with KEEP staff to ensure long-term financial support through Wisconsin utilities’ statewide energy efficiency and renewable resource program, [Focus on Energy](#), which ended in May 2012. Recognizing KEEP's value, Wisconsin's six major utilities (Alliant Energy, Madison Gas & Electric, We Energies, WPPI Energy, Wisconsin Public Service, and Xcel Energy) have continued funding KEEP on an annual basis. Furthermore, KEEP leverages base funding to receive additional grants supporting focused projects and energy education initiatives throughout the year.



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The success of KEEP from both the private and public standpoints reflects well on the various organizations that have invested in energy education, communicating their support of developing energy literacy among teachers and their students (KEEP, 2005). Stakeholders and supporters of energy literacy are working with KEEP to explore additional funding options to ensure the continuation of KEEP and its programs and services to teachers and their students. An advisory group which includes representation from utilities, energy industry, educational administration and teachers, and nature centers and non-profit organizations meets annually to provide guidance and direction on KEEP programming.

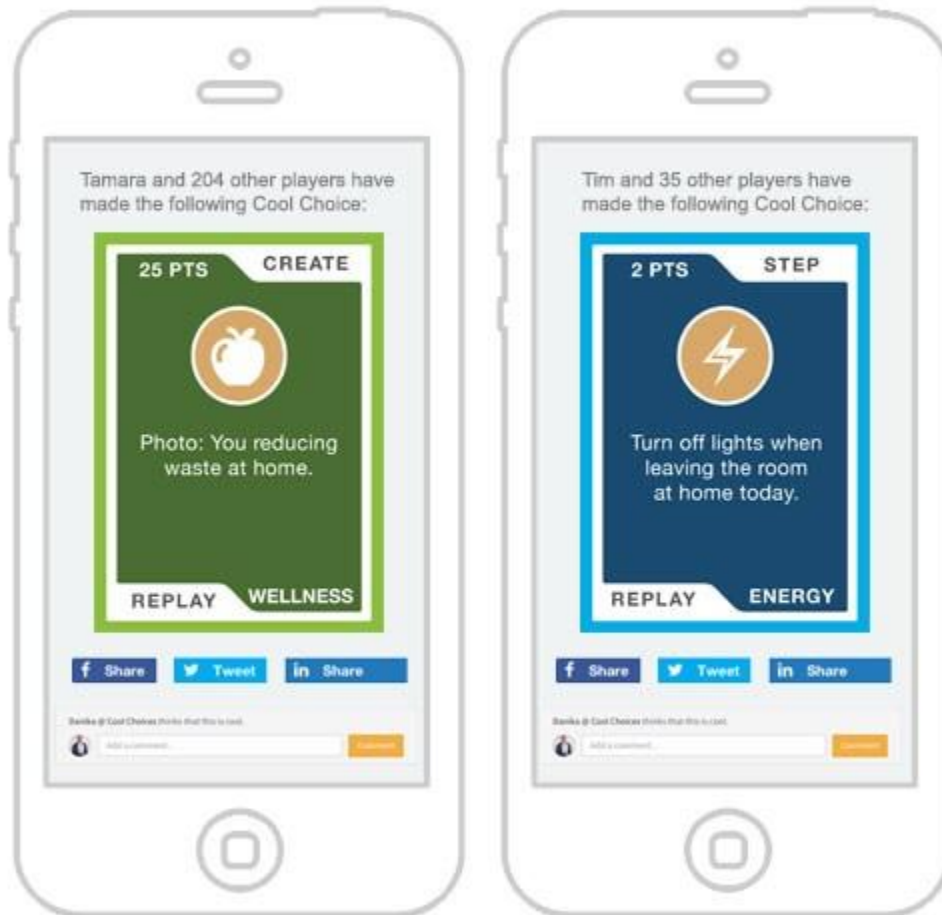
KEEP continues to evolve and remain current to educational and energy use trends by: aligning curriculum materials to current national and state standards; offering hands-on, minds-on learning opportunities for students and teachers that build the necessary skills to address current energy-use issues; and developing strategies for taking lessons learned in the classroom to apply to the greater community. The legislative structure in Wisconsin for environmental education and strong stakeholder relationships with energy professionals provide a solid foundation to advance energy literacy and help reduce energy use overall.

### **Environmental Psychology: Gamification for Behavior Change**

While professional development and quality curriculum development remain the core of KEEP, in recent years, the program has added various supports for teachers teaching about energy. Many of these are intended to inspire behavior change and help teachers and schools track energy use. One effort tied particularly closely to emerging psychological research is KEEP's foray into gamification through a partnership with [Cool Choices](#)<sup>9</sup>, a non-profit organization based in Madison, Wisconsin, that offers a fun, social, and easy online game and employee engagement platform that helps organizations, including schools, adopt sustainable practices and document real energy-savings results. Although gamification as an approach to behavior change is only a few years old, it has become widely used by business, schools, non-profits, and governments around the world. A study by Grossberg, Wolfson, Mazur-Stommen, Farley, and Nadel (2015) found at least 22 well-developed games being implemented by U.S. utilities as part of energy efficiency programs. Gamification is "using the features of games to accomplish a real-world objective...[and] gamified solutions transform everyday activities into game-like experiences" (Grossberg et al., 2015, p. 1).

The Cool Choices game is designed such that participants play virtual "cards" on their computer, tablet, or smart phone based on the pro-environmental behavior indicated on the card (e.g. reduce speed when driving, unplugging unused appliances/electronics, etc.) and receive points by completing the action. Different numbers of points are earned for new and habitual actions to reward previous behavior and inspire changes. Cards played can be viewed by all players, a feature that encourages accountability and honesty. Participants often play in teams further enhancing the level of competition and providing a greater incentive to engage in conservation behaviors. The game emphasizes taking specific actions now to help players understand how their local, immediate actions can influence a long-range challenge like climate change. Individual and collective actions demonstrate that one person can make a difference (Kuntz, Shukla, & Bensch, 2012).





## [Coolchoices](#)

In 2013, KEEP developed a partnership with Cool Choices to administer the online behavior change game in Wisconsin schools working toward [Green & Healthy Schools Wisconsin](#) recognition. As part of a pilot program conducted by Seventhwave and offered January-May, 2014, 411 teachers, students, facilities and kitchen staff, administration, and parents from 22 schools reported taking 22,188 actions backed by energy-saving data. In all, direct energy-related actions—mostly activities done at home—resulted in an estimated annualized impact of about 25,400 kilowatt-hours and 58 therms. The pilot program evaluation found that many participants in the Cool Choices game liked the increased awareness and opportunities for learning the game created. Many respondents commented that there is room for improvement within their school districts to become more “green.” Participants also commented that the game is a fun way to get both staff and students involved in making better choices both at school and at home (La Haise, 2014).

Here is a personal quote from a participant in the game:

***“The Cool Choices game has definitely raised staff awareness on how they can contribute to sustainability and the conservation of resources at work, but the game has also led to people talking to others and sharing ideas on how our district’s policy and choices contribute to***

*becoming a Green and Healthy School. The competition is awesome-we all look forward to playing our cards each day.”*

The Cool Choices – Green & Healthy Schools Wisconsin partnership continues allowing hundreds of schools statewide to participate<sup>10</sup>.



## Critique

KEEP has supported the energy education of Wisconsin's K-12 teachers for nearly two decades, serving more than 6,000 teachers who have influenced an estimated three million Wisconsin students since 1997.

**Designed to operate as a long-term, holistic educational strategy, the program's intent is to increase the energy literacy among K-12 students that can lead to positive impacts throughout their lives, even as they grow into adults with their own households (La Haise, 2014).**

Looking ahead, KEEP faces a variety of recurring and new challenges. Like many environmental education programs, KEEP has realized that new knowledge does not always lead to new behavior. The program will need to continue exploring economic incentives for decreasing energy use at school and at home and continue to learn from psychology research on behavior change. Efforts like the partnership with Cool Choices have been good first steps in the direction of actually reducing energy consumption and energy costs.

Like all well-established programs, KEEP will also need to continue to change and adapt to remain relevant. The educational and political climate of Wisconsin has shifted over KEEP's twenty years. Funders now expect stronger evaluations and clearer links between money invested in education and documented energy savings. Teachers are looking for different professional development opportunities that fit their busy schedules, are available online, and meet new licensure and promotion requirements. Teachers also need curriculum material correlated to the new Common Core and Next Generation Science Standards. KEEP has altered its approach to evaluation, shifted to a mix of online and face-to-face courses that can be taken for credit or audited, and correlated lesson plans to the new standards, but there is still work to be done.

What has not changed as KEEP heads into its third decade is that teachers, students, and community members need to be literate, responsible consumers of energy. Energy education is as important now as ever to curb energy consumption and ultimately minimize the negative effects of climate change.

Find more energy education success stories within Wisconsin schools online<sup>11</sup>.

## External Links

- 1 Wisconsin K-12 Energy Education Program (KEEP) 2014 Annual Report [Issuu](#)
- 2 Energy Everywhere – An Introduction to Energy Literacy [USdepartmentofenergy](#)
- 3 [Wisconsin K-12 Energy Education Program Uwsp](#)
- 4 [Wisconsin K-12 Energy Education Program Uwsp](#)
- 5 [Greendale schools charged up by energy challenge Greendalenow](#)
- 6 [Reducing energy usage adds up for Westby Schools La Crosse Tribune](#)
- 7 [Environmental Education in Wisconsin - Wisconsin EE](#)  
[Einwisconsin](#)
- 8 [Across the Spectrum: Resources for Environmental Educators, Second Edition \(2015\) NAAEE](#)
- 9 [Cool Choices Customer Reviews Cool Choices](#)
- 10 [Environmental Education in Wisconsin - Green & Healthy Schools Cool Choices Success Stories Einwisconsin](#)
- 11 [School and Teacher Highlights - Wisconsin K-12 Energy Education Program | UWSP](#)

## Discussion Questions

- 1) The KEEP model involves three essential building blocks: funding, conceptual framework, and evaluation/assessment. Considering your current professional experience, describe ways this model might apply in your current professional situation. Describe how ideas shared are similar to your current or previous experiences. What new idea(s) are you taking away to consider adding in your professional situation?
- 2) Energy education has opportunities for direct financial savings. KEEP outlined explorations for correlating sustainable behaviors directly to financial savings. What considerations must be made when gathering quantifiable data related to individual action and behaviors?
- 3) Describe the most beneficial opportunities you see in addressing energy literacy using a teacher professional development model. What other considerations or approaches might you suggest for tackling the wicked problem of energy literacy?

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## **Authors**

Annie Baker, Outreach Specialist, Wisconsin K-12 Energy Education Program

Susan Schuller, Senior Outreach Specialist, Green & Healthy Schools Wisconsin, Wisconsin Center for Environmental Education

Kendra Liddicoat, Assistant Professor & Interim Director, Wisconsin Center for Environmental Education, University of Wisconsin – Stevens Point