



KEEP On Going

Spring 1999 Vol.1 No. 2

Instituting Energy Ed

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Wisconsin K-12 Energy Education Program

a collaboration of
Wisconsin Center for
Environmental Education
and
Energy Center of Wisconsin

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This summer, the Wisconsin K-12 Energy Education Program (KEEP) will pilot the first Energy Education Partnership Institute. These institutes will build partnerships among teachers, community professionals, and students to develop innovative school-wide energy education projects. The first institute will take place in Stevens Point; we are tentatively planning for the week of August 9, 1999.

The Energy Education Partnership Institutes are a natural extension of our inservices, providing more in-depth professional development for teachers desiring leadership skills in energy education. The pilot is funded through the Energy Center of Wisconsin and implemented by the Wisconsin Center for Environmental Education.

Participants will consist of teams of teachers from the same school district. Prior to the institute, the district will outline its energy-related needs and goals. For example, many of the Wisconsin Academic Standards relate to energy and can be addressed through energy education. Another goal may be to save money by improving the school's energy efficiency.

To address their goals, the teams—working in partnership with energy resource professionals—will participate in the following activities:

- Exploring strategies to address academic standards through energy education
- Investigating innovative energy education resources, such as CD-Roms and the Energy Cycle
- Gaining skills to measure energy use (for example, using equipment to measure wattage or to select a site for a solar energy installation)
- Designing teaching plans to get students involved in school-wide energy education projects



Two Neenah teachers make “energy ice cream”, one of the hands-on ways KEEP teachers are demonstrating energy concepts.

Continued on page 2

From KEEP

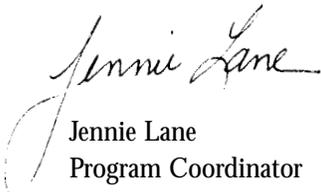
Thank you! With your help, we are nearly done revising the *KEEP Activity Guide*. Your reviews played an instrumental role in letting us know what worked and what didn't. We appreciate your suggestions. Once again, we have included some of your ideas in the *Energy Sparks* section of this newsletter.

The guide has a bright new cover. We also redesigned the activity format. Although a number of you recommended that we divide the guide into two volumes, the expense of buying and mailing two sets of binders prevented us from doing this. We do have binders that are more manageable, we've reduced the size of the guide, and we've removed a couple of activities that you indicated were too difficult or irrelevant to your needs.

We also added a couple of new activities. "Viewpoints" involves students in researching printed and electronic media to analyze perspectives on global climate change. This activity is appropriate for high school students. For elementary school teachers, we developed an activity called "Exploring Heat." Teachers of young children will be pleased to know that we plan to publish a supplement to the guide that contains more activities for elementary students.

On a final note, I'd like to emphasize how much we'd like you to contribute to future editions of *KEEP On Going*. Our next newsletter will be published in the fall of 1999, so if you would like to share energy experiences or upcoming events please let us know by the end of the summer.

Here's wishing you an energetic spring and summer. We look forward to seeing you at the Student Environmental and Energy Action Conference and at the Midwest Renewable Energy Fair!



Jennie Lane
Program Coordinator

Continued from page 1

Teams will implement their plans the following school year. KEEP staff will provide consulting and support services to help them.

Community resource professionals, facility managers, and administrative staff are essential to the program's success. Community resource professionals and facility managers will provide technical assistance and model energy-related work skills to students. Administrators ensure school-wide awareness and support of the energy education project.

KEEP is looking for districts to participate in future institutes. If you would like your district to get involved, please share this information with your curriculum coordinator and superintendent. The Energy Center of Wisconsin and the Wisconsin Center for Environmental Education (UW-Stevens Point) are raising funds to provide participating teachers with stipends and university credit and to furnish each district with an energy resource kit. We encourage interested districts to join us in fundraising. ■

A Promising Update on Energy Education

In a few months, you will receive a free copy of *Promising Energy Education Practices: Creating a Network of Energy Educators*. This guide represents the successful efforts of teachers such as yourself to "energize" curriculum. KEEP graduates from around the state volunteered submissions to "Promising Practices" which include creative twists and adaptations to activities or projects dealing with energy. The guide will also be available on the Web at www.energied.ecw.org.

The guide includes charts that cross-reference the practices to grade level, subject areas, academic standards, and KEEP activities. Each promising activity also includes contact information. We invite you to use these promising practices as creative springboards for designing even more activities, projects, and school-wide events in energy education.

We at KEEP would like to thank all of the teachers that shared their stories of success with energy education in their classrooms. You are an inspiration to us to KEEP on going.

Promising Practices is designed to be an evolving document. So let us hear about *your* promising practices. Write us at the KEEP office and give us the basic information and we'll make sure to include it in our next publication.

Energy Fair Approaches

Summer Solstice is quickly approaching and with it comes the Midwest Renewable Energy Fair, a three-day event with more than 110 workshops, 90 exhibits and demonstrations, quality entertainment, and good food. This year the Midwest Renewable Energy Association will celebrate the 10th anniversary of the Energy Fair on June 18-20 in Amherst, Wisconsin.

The Energy Fair offers over 30 workshops specially designed for educators and children.

Children can learn how to build a model solar race car or solar oven and even help crank homemade ice cream. Teacher workshops include How to Build Electrathon Vehicles in the Classroom, Energy and Air Quality Issues, and Energy Education Resources. Teachers may receive continuing education credit through the University of Wisconsin-Stevens Point for attending the Fair.

The Midwest Renewable Energy Association is also looking for children's and teachers presenters for the 1999 Energy Fair. Present a one hour workshop and receive a free entertainment pass, invitation to the networking dinner, and a free weekend Energy Fair pass.

For more information, or to present a workshop, contact the MREA office; phone: (715) 824-5166 fax: (715) 824-5399, or e-mail: mreainfo@wi-net.com

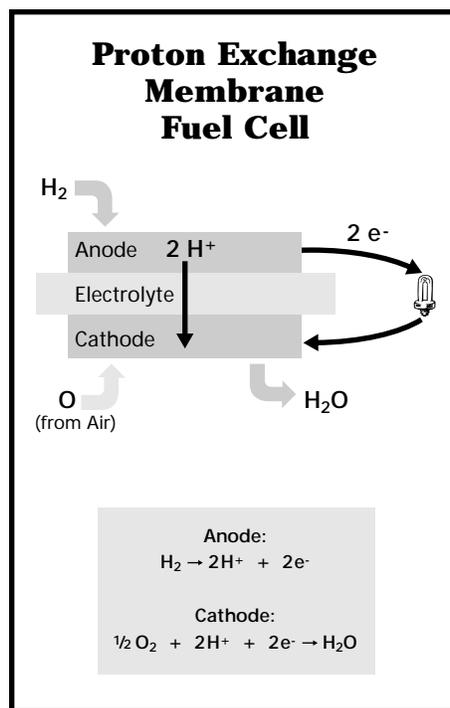
Katy Matthai

Associate Director, Midwest Renewable Energy Association

Bring Fuel Cells into Your Classroom

A Madison area company, DCH Technology, is loaning KEEP a set of Proton Exchange Membrane fuel cells. DCH believes that teachers can use these fuel cells in innovative ways and asked us to help them identify some good curriculum strategies.

Given this challenge we naturally turn to you, the KEEP teachers. Some of you probably have excellent ideas about how you might incorporate a fuel cell into your curriculum. We want to hear from you and then we'll lend the fuel cell (likely on a semester basis) to teachers who have promising ideas.



Here is some background on the fuel cell:

At the heart of the fuel cell is a proton exchange membrane. This membrane conducts protons but not electrons. On one side of the membrane hydrogen gas breaks into protons and electrons. The protons travel through the membrane. The electrons travel through an external circuit and perform work.

If these fuel cells are run on pure hydrogen and air they produce electricity and water with no other emissions. If the hydrogen is obtained by splitting water with renewable energy such as wind or solar a completely sustainable and nonpolluting electrical energy cycle is possible.

DCH Technology will provide a fuel cell which will generate approximately 2 volts and 1 amp DC. It will be approximately two inches in diameter and 1.5 inches long.

You will need a hydrogen supply to run the fuel cell. DCH will either provide the hydrogen or help us find you a supply. Hydrogen with very low carbon monoxide content is required.

If you'd like to apply to borrow the fuel cell call KEEP to get an application. You can also download the application form from the Energy Ed Online website at www.EnergyEd.ecw.org. ■

KEEP Calendar

April 22, 1999

Earth Day.

April 28, 1999

Energy! Experience the Power: 1999 High School Environmental and Energy Action Conference, UW-Stevens Point, Stevens Point, Wisconsin

June 18-20, 1999

Midwest Renewable Energy Fair, Amherst Fairgrounds, Amherst, Wisconsin.

August 1999

KEEP Education Institute, Stevens Point, Wisconsin

Let's Shed New Light on Your Classroom

Kathy Kuntz, Energy Center of Wisconsin

What if you could improve the energy efficiency of your classroom while increasing your students' overall performance?

Well, you can. And the strategy is easier than you might expect—daylighting. "Daylighting" means using natural light—the sunlight coming through the window—to light your classroom. Typically daylighting allows you to turn off some of the overhead classroom lights, thus saving energy. Studies also show that daylighting improves productivity and, in some cases, has a positive effect on student performance and health. (This news is not surprising me; I struggled for years to get an office with a window!)

The Energy Center of Wisconsin has a new statewide daylighting initiative to promote daylighting and, as a member of the KEEP network, you can participate.

Tell us about a daylighting opportunity in your school district

At present Center staff is looking for two kinds of classroom situations:

- Schools that are currently under construction (scheduled to open in the fall of 1999 or in 2000)
- Existing schools with reasonably high ceilings (9 feet or more) and ample windows along one wall

When you contact the Energy Center they will explore the opportunity and, if appropriate, help to make daylighting a reality in your school. The Center hopes to have at least four Wisconsin sites so we may not be able to help everyone right away. We will, however, do what we can to facilitate daylighting in as many sites as possible.

Where we do establish sites, we will work with teachers to ensure that their students have opportunities to investigate energy savings and other benefits of daylighting.

Help us collect data on student performance

A lot of schools built during the 1970s have some classrooms with windows and others without windows. We are interested in learning how student performance in the windowed classrooms compares to performance in the windowless classrooms. Specifically we want to know the following:

- Are there differences in absenteeism?
- Are there differences in test scores on standardized tests?
- Are there differences in health records? (Some studies suggest that students in daylit classrooms grow taller and have fewer cavities than students in non-daylit rooms.)
- Are there differences in the frequency of disciplinary problems?

We are also interested in whole *schools* where performance seems to vary noticeably from schools in the rest of the district. For example, do you know of a school where the absenteeism rate is notably higher than other comparable schools in the district?

Tell us about daylit schools that already exist in the state

We are not aware of any daylit schools in Wisconsin, so we want to hear from you if you know of any. By "daylit schools" we mean schools where daylighting is used on a regular basis instead of overhead lights in classrooms, the gym, or other frequently used spaces.

To participate in the daylighting effort or for more information, contact Kathy Kuntz, phone: (608)238-8276 x24 or email: kkuntz@ecw.org ■

Inservices Get New Funding

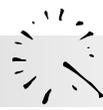
As of January 1, 1999 KEEP teacher inservices entered a new phase. The inservices are still free to teachers but the cost of these inservices—graduate tuition, materials, and so on—is covered by scholarships.

The Energy Center of Wisconsin funded the inservices for the first 600 KEEP teachers as part of the development of KEEP. Rather than continuing to fund the inservices directly, Energy Center staff is raising "scholarship" money from other sources including Wisconsin utilities, foundations, and corporations.

As of February 15 the Center raised enough money to cover inservices for an additional 360 Wisconsin teachers in 1999. The scholarship donors are:

- Alliant Energy (100 scholarships)
- Madison Gas & Electric Company (60 scholarships)
- Northern States Power Company-Wisconsin (100 scholarships)
- Wisconsin Electric Power Company (100 scholarships)

Some of Wisconsin's municipal utilities and several corporations have also expressed interest in the scholarship program. For more information about how to participate, contact Kathy Kuntz at the Energy Center at (608)238-8276 x24.



The Energy Sparks section of our newsletter is dedicated to highlighting the creative changes teachers have made to existing KEEP activities. Here's how teachers have adapted the activity "Energy Use Then and Now."

We encourage you to send us your ideas. These can be variations or adaptations of a KEEP activity or some other energy teaching tip that you would like to share.

"Energy Use Then and Now" p. E 75

Activity Summary: Students research energy use practices of the past and compare them to energy use practices of the present.

Take a Walk Through Time

At Riverside Elementary, Susan Thompson helps her 6–8 graders compare energy use in the past and present by relating it to human population growth and societal changes. Students selected a topic such as home heating, cooling, household chores, food preparation/preservation, or travel. Using the school library, they researched how the activity was accomplished during four times periods: pre-agrarian, early agrarian, post-agrarian, and the modern technological era. Ms. Thompson also had them investigate how energy use affected the environment. Students presented their understanding of energy use through time in various forms such as plays and multimedia video.

Campfires vs. Technology

At YMCA Camp Edwards, Paul Denowski uses an evening campfire with students to show how energy use has changed. Students learn how the energy of campfires has been replaced with modern technology and appliances. They find that in our modern day world, entertainment and the art of storytelling around the campfire has been replaced by the radio and television. The warmth from campfires has now been replaced by gas and electric heaters. Lamps have replaced the light of fires and microwaves and ovens have replaced cooking. But nothing modern can replace toasting a marshmallow over a toasty fire!

Energizing History

When Mary Forseth's fifth graders at Holy Name School study U.S. history in their social studies curriculum, they look at energy use too. For example, as Colonial times are studied, students research how various tasks were done, what tools were used, and how energy was used to make these tasks possible. When studying the Industrial Revolution, Great Depression, World Wars, and post-war economic boom, students track changes in energy usage. And while studying the 1970's students discuss energy conservation.

An Energizing Writer's Workshop

At St. Mary's School in Marathon, JoAnn Emerson's sixth grade students had the chance to become energy historians. Their investigation was conducted as a writer's workshop, in which students took two weeks to interview their grandparents and record the many different energy sources they used to complete everyday tasks, such as travel, cooking, cleaning, and recreation. The grand finale was to write a story comparing energy uses and sources for the two generations. Ms. Emerson suggests that a creative extension for this activity would be to compile these stories into a booklet to give to the grandparents and parents of the students.

Energy in the Past Museum

Do you like museums? Fran Wong's students do. To compare energy use today to energy use in the past, they created their own energy museum. Students found appliances, tools, and toys that were used long ago by their grandparents and other relatives. Then they interviewed the owner of the object to research its history, use, source of energy, the amount of energy it consumed, the cost of its energy use, and the effect of that energy use. Then they compared it to more modern versions of the object. They shared their findings with the rest of the class and used their antiques to create the energy museum.

Internet Sites Related to Energy Education



Would you like to have your students investigate energy policies, energy efficiency or alternative energy sources? Would you like to find more resources available to you in energy education? Then tap into the Internet as a resource! Here are a few interesting and helpful sites:

www.energied.ecw.org

Energy Ed Online. This Energy Center of Wisconsin web site offers a wealth of information on energy education. You'll find information on KEEP, Energy Cycles, field trips, energy careers, and much more.

www.eren.doe.gov

Department of Energy

www.epri.com

Electric Research Power Company

www.eei.org

Edison Electric Institute

www.gri.org

Gas Research Institute

www.ecw.org

Energy Center of Wisconsin. The Energy Center of Wisconsin is a private nonprofit organization dedicated to improving energy efficiency in Wisconsin. They provide energy efficiency programs, research

and education to residents, businesses and government.

www.solstice.crest.org

Center for Renewable Energy and Sustainable Technology

www.wpsr.com

Wisconsin Public Service

www.doa.state.wi.us/deir/boe.htm

Wisconsin Energy Bureau

www.leeric.lsu.edu/ee_education

Louisiana Energy and Environmental Resource and Information Center.

Provides lesson plans on alternative energy.

www.energy.ca.gov/education

Energy Quest from the California Energy Commission. Includes classroom activities and teacher resources on alternative energy and interactive educational games that students can play on-line.

sel.me.wisc.edu

UW-Madison College of Engineering Solar Lab. This is the oldest solar energy lab in the world. It has been recognized nationally and internationally for its accomplishments in practical solar energy applications.

www.xmission.com/~nef

The National Energy Foundation (NEF) is devoted to developing energy-related instructional materials and innovative teacher training and student programs.

Global Warming Web Sites:

www.puc.ohio.gov/consumer/gcc

Public Utilities Commission of Ohio (PUCO) Global Climate Change Site.

www.epa.gov/globalwarming/home.htm

U.S. Environmental Protection Agency's (EPA) Global Warming Web Site. This site is divided into six areas: science and impacts of global warming; policies and programs; easy ways to get more information; other global warming web sites; quick facts; and latest developments.

www.edf.org/issues/GlobalWarming.html

Environmental Defense Fund Global Warming Site. Recent reports and articles about global warming, global warming facts versus reality, and much more!

www.globalchange.org

Solstice Global Change. Includes information on energy efficiency, renewable energy, and sustainable technology information and connections. You will also find a review of climate change and ozone depletion and a month-by-month summary of happenings in climate change.

Learn More About Sustainability

The President's Council on Sustainable Development and the Global Environment & Technology Foundation are sponsoring a National Town Meeting for a Sustainable America on May 2-5 in Detroit, Michigan. The event will "highlight the work of communities, businesses and individuals who are offering new solutions to help America grow in a sustainable way."

Your students can participate in a variety of ways. They can learn more about sustainability on-line and there is an opportunity to attend the conference and cover it as a reporter for the National 4-H Council! For more information, check out the "Field Trips" section of Energy Ed Online (www.energied.ecw.org).

Experiencing the Power!

Wisconsin high school students and teachers will be experiencing the power of energy at the 1999 High School Environmental and Energy Action Conference. The conference will be held on April 28 at the University of Wisconsin-Stevens Point. The purpose of the conference is to highlight energy issues, showcase student projects, and build the skills necessary to solve environmental dilemmas.

The theme of this year's conference is *Energy! Experience the Power*. The keynote speaker will be Pat Arndt, with students from Berlin High School's Environmental Crusaders Acting for Earth Preservation Club. They will present "The Ghost of Electrical Past."

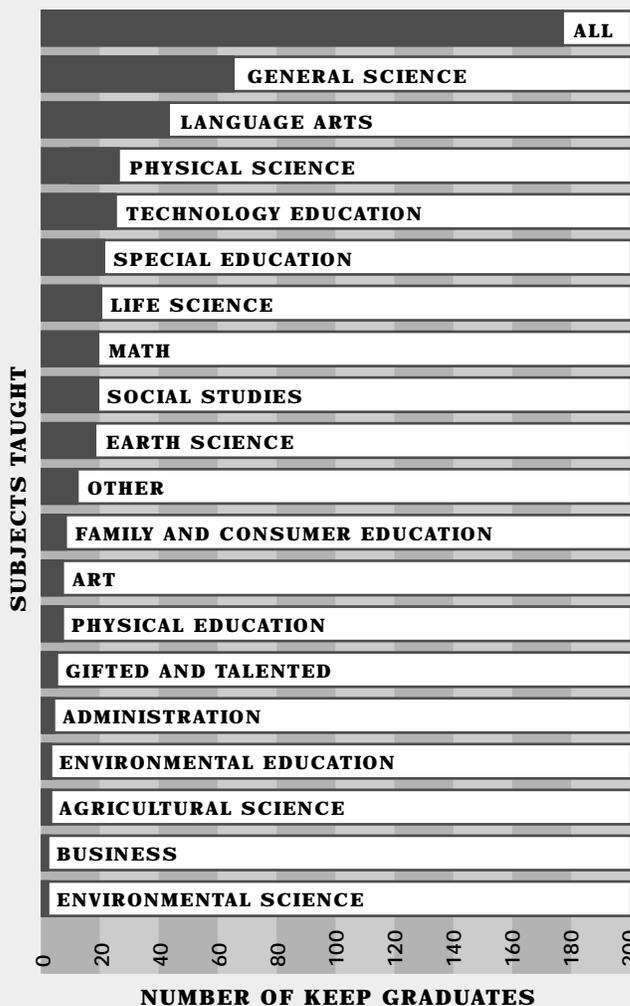
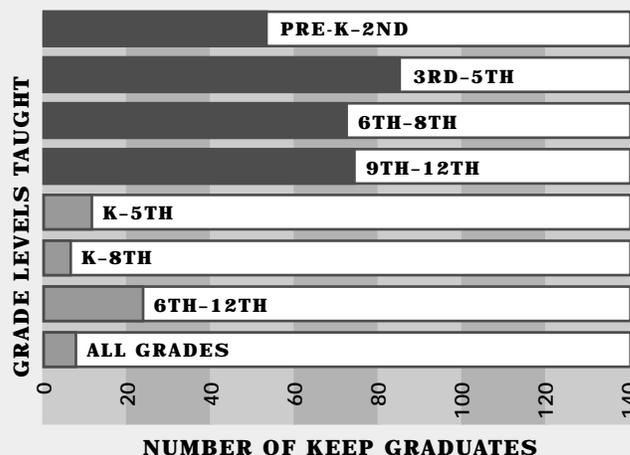
Presentations include:

- Paul Robertson and students from Antigo High School on the *Solar Olympics*
- Steve Hansen and students from Wausau East High School on the *Sun Chaser*
- Todd Steffen from Wisconsin Public Service on *Wind Generation*
- Harv Hayden and students from Lincoln High School on *Rainforest Biodiversity*

The Wisconsin Center for Environmental Education and the Energy Center of Wisconsin teamed up to provide this opportunity.

Teachers can still sign up for the conference. For more information, contact the Wisconsin Center for Environmental Education at (715)346-4973.

Tracking KEEP Graduates



Here at KEEP we're delighted to see the large variety of teachers that are learning about energy education. Not only do KEEP graduates teach a wide range of grade levels (*top graph*) but their subject areas span science, social sciences, and language arts (*bottom graph*). As of March 1, 1999, 587 teachers have taken KEEP inservices.

The Energized Poets of St. Adalberts

Are you looking for a fun and creative language arts activity to review energy concepts? At St. Adalberts in Rosholt, Lisa Mercurio-Wroblewski and her students wrote energy haikus and other poetry about energy. Here are some of the things these energized poets had to say:

A Windy Haiku

By Lisa Mercurio-Wroblewski

The wind blows and blows
Sending shivers down my spine
Winter hanging on

Energy Haikus

By Luke Cieslewicz

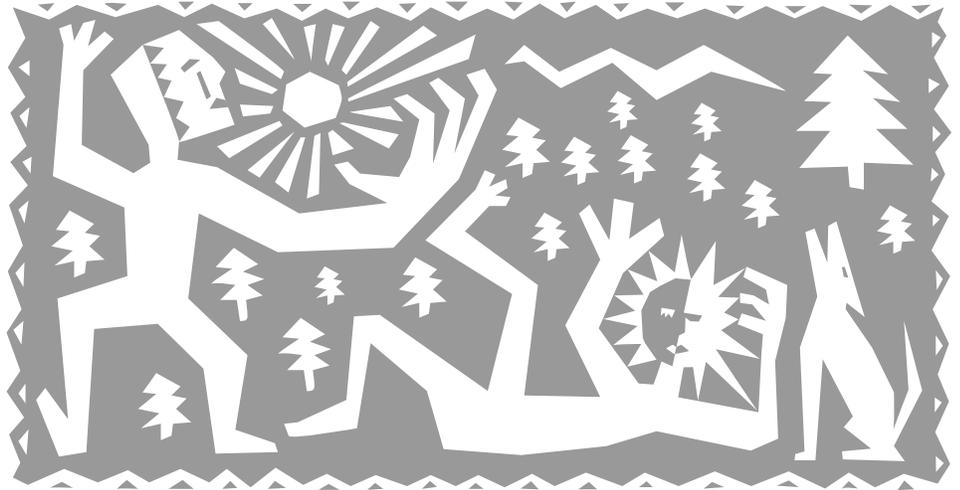
We use resources
Foolishly we waste them all
Soon they will be gone

Wind, solar, water
Nuclear fusion and air
Electricity

Water

By Ashley Zblewski

Waterwheels and dams
Turns water into energy
Which makes other things run



The Sun

By Linda Kostuch

Bright, Big, Warm, Yellow
Energy for things to grow
Human life, flowers

Water

By Samantha Estrella

Water we drink
A body of water
To make our plants grow
Electricity
Rain

Animal Power

By Dustin B. Dulek

Animal Power
Is used for travel
Snow, roads, work
And even for fun!

Wood

By Dustin B. Dulek

Grown from Mother Earth
It's used for man's heat
Chopped, stacked, burned
AHH warmth