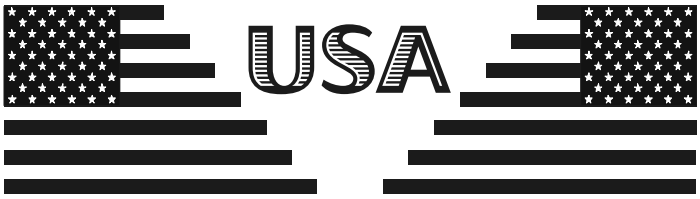
energy EXCHANGE

A publication of the National Energy Education Development Project November 2001



Empowering Students

In times of national crisis, many children become frustrated by feelings of helplessness. They want to do something to help. Let them know that learning is an important job. Empower your students by encouraging them to do their job well by learning all they can. Students can help their country by learning about energy and using it wisely.

!! Think Summer !!

Brochures Are In The Mail

Sign up now to attend one of NEED's energizing summer training conferences––July 13-17 in Galveston, TX, and July 20-24 in Charleston, SC. Learn about NEED's new materials, take interesting energy field trips, and hear about energy from the experts. If you haven't received the conference brochure, give us a call at 1-800-875-5029 or visit our website at **www.NEED.org**.

NEW SOLAR ACTIVITIES

NEED has developed hands-on solar energy units for primary and intermediate grade levels, with funding from the Illinois Department of Commerce and Community Affairs.

The ***Energy From the Sun*** (K-4) unit introduces primary students to basic concepts of solar energy with background information and hands-on activities. Students cook with solar ovens, build cardboard houses with PV cells that run lights and fans, and more. The ***Energy From The Sun Kit*** includes multiple thermometers, radiometers, solar balloons, solar ovens, solar house kits, and sun-sensitive paper. The Teacher and Student Guides will be available for review on NEED's website in November. The kit will be available for purchase in December for $350.

The ***Exploring Solar Energy*** (5-8) unit provides a more in-depth understanding of solar energy with background information and center-based activities. The kit includes five sets of radiation cans, thermometers, PV cells, motors, concave mirrors, and solar collection materials. The Teacher and Student Guides will be available for review on NEED's website in November. The kit will be available for purchase in December for $300.

See pages 3-4 for sample solar activities.

Inside this issue....

The NEED Project

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The NEED Project is a 501(c)(3) nonprofit education association providing professional development, innovative materials correlated to the National Science Education Content Standards, ongoing support and recognition to educators nationwide.
A list of NEED sponsors is available on our website and in our Annual Report.

Call 1-800-875-5029 for information on NEED programs in other states.

CALENDAR OF EVENTS

For more information, contact info@need.org or 1-800-875-5029.

November 2001

11/2	ILEED Workshop - Mt. Carroll, IL
11/2	AL-NEED Workshop - Baldwin, AL
11/6	ILEED Workshop - Charleston, IL
11/6	KyNEED Workshop - Bowling Green, KY
11/7	ILEED Workshop - Mt. Vernon, IL
11/7	RI NEED EnergyWise Schools Workshop - Cranston, RI
11/8	ILEED Workshop - Alton/Godfrey, IL
11/8	Cicero Public Schools NEED Workshop - Cicero, IL
11/8	RI NEED EnergyWise Schools Workshop - Cranston, RI
11/9	Chicago Public Schools NEED Solar on Schools Workshop - Chicago, IL
11/8-10	NEED Sessions and exhibits at the National Science Teachers Association Regional Convention - Columbus, OH. *A NEED reunion event is planned for current and former NEED teachers - email Mary Spruill (mspruill@need.org) for more information.*
11/10	Wake County NEED Workshop - Raleigh, NC
11/12	KyNEED Workshop - Perry County, KY
11/12	Bayfield NEED Workshop - Bayfield, CO
11/13	La Plata County Science Cluster Workshop - Bayfield, CO
11/13	KyNEED Workshop - Leslie County, KY
11/14	KyNEED Workshop - Knott County, KY
11/14	RI NEED Workshop - Providence, RI
11/15	ILEED Workshop - Schaumburg, IL
11/19	ILEED Workshop - Quincy, IL
11/19	KyNEED Workshop - Highland Heights, KY
11/20	KyNEED Workshop - Mayfield, KY
11/22-23	NEED Office closed for Thanksgiving holiday
11/27	KyNEED Workshop - Berea, KY
11/28	KyNEED Workshop - Owensboro, KY
11/30-12/2	Energy Training Certification - Energy Management for High School Teachers and Students - Bloomington, IL

December 2001

12/2-3	ILEED Teacher Advisory Board - Chicago, IL
12/10	KyNEED Workshop - Paducah, KY
12/11	KyNEED Workshop - Independence, KY
12/12	KyNEED Workshop - Whitesburg, KY

(for a listing of Ohio workshops see www.ohioenergy.org/workshops2.htm)

June 2002

6/21-24	National Youth Awards for Energy Achievement - Hyatt Regency Crystal City, VA

July 2002

7/6-11	ILEED Camp KEEP (Kids for Energy and Environmental Protection) - Algonquin, IL
7/8-12	KyNEED Statewide Energy Conference for Educators
7/13-17	NEED National Energy Conference for Educators - Galveston, TX
7/13-19	ILEED Camp KEEP (Kids for Energy and Environmental Protection) - Cantrall, IL
7/20-24	NEED National Energy Conference for Educators - Charleston, SC

NEED NEWS

Karen Reagor Wins Governor's Environmental Excellence Award

Congratulations to Karen Reagor, NEED's Regional Director and Kentucky Coordinator. Karen was awarded the Governor's Award for Environmental Excellence in the energy education category at the Kentucky Governor's Conference on the Environment on October 30, 2001. Karen was recognized for her outstanding achievement in developing the KyNEED Project into one of the nation's best energy education programs with collaborative partnerships throughout Kentucky.

Youth Awards WILL Be Held In June!

We've received several calls since September 11 wondering about the status of the Youth Awards program. We know that some school systems have restricted field trips until the end of the year, but are confident that the Youth Awards program will be a success. The hotel has assured us that they will make whatever accomodations are necessary to ensure the safety of all participants, and Reagan National Airport has reopened. If flights into Reagan become a problem, we will redirect flights to Dulles or BWI and arrange bus service. The program is from June 21-24, 2002. The registration fee is still $500.

Park View Students Shine

The Park View Middle School NEED Team of Cranston, RI, led by Joanne Spaziano, were the stars at a recent Home Depot Energy Expo. Their presentations on energy efficient lighting and NEED's Energy Conservation Contract will help Rhode Islanders save valuable energy dollars. The group also hosted a booth at the Rhode Island Energy Expo at the Providence Civic Center. Both expo presentations were sponsored by Narragansett Electric and the Rhode Island State Energy Office.

Energy$mart Schools Partnership

The NEED Project is pleased to announce that it is an official Education Partner with the Department of Energy's Energy$mart Schools Program. For more information on Energy$mart Schools, contact Blanche Sheinkopf at bsheinkopf@energysmartschools.net or Mary Spruill at mspruill@need.org.

New Program in Colorado

NEED launched a new program in Bayfield Public Schools in September. Educators participated in a two-day workshop and received a full complement of NEED materials and kits, thanks to the support of BP. For more information on the Bayfield program, contact info@need.org.

Illinois Program is Rocking

For 2001-2002, the Illinois Department of Commerce and Community Affairs is sponsoring a full NEED/ILEED workshop series. Fifteen workshops are being conducted throughout the fall, introducing hundreds of new teachers and students to the NEED program.

Energy Ant is on the Move

The EIA Kid's Page Mascot – ***Energy Ant*** – received an all-expenses-paid trip to Ventura, California in October. ***Energy Ant*** was hosted by the U.S. Minerals Management Service and Pacific Region Public Affairs Officer John Romero. ***Energy Ant*** boarded a helicopter and toured a Venoco, Inc. offshore oil and gas production platform with cameras rolling. The three foot tall ***Energy Ant*** is being used to chronicle energy field trips to locations that most students and teachers will never have a chance to see. Log-on to **www.eia.doe.gov/kids** for ***Energy Ant's*** latest adventures!

TEACHER RESOURCES

www.eia.doe.gov / kids: The EIA Kid's Page is updated regularly with new information. Check out the adventures of ***Energy Ant***, the Kid's Page Mascot, as he travels to energy sites such as off-shore oil and gas platforms.

www.NEED.org: NEED's new website has been activated! It has downloadable resources for teachers, as well as links to many other energy-related websites with educational materials. New materials for teachers are being added all the time. Email us at info@need.org to let us know what you think of our new website.

Look for NEED's new solar curriculum for Grades K-8 on the website in November and send us your comments.

Energy$mart Schools Activities: The Department of Energy's Energy$mart Schools Program has a new CD-ROM available–*Get Smart About Energy*–with 300 lessons for students covering energy sources, production, environmental impacts, and how to save energy with new technologies and behavior modification.

A classroom poster is also available entitled *Buildings in the American Century*, which shows construction technologies, materials, and energy usage. Both the CD-ROM and poster are available free-of-charge by calling 1-800-DOE-3732 or by going to the Energy$mart Schools website at **www.energy.gov**.

www.fsec.ucf.edu / Ed / Teachers: The Florida Solar Energy Center has many wonderful resources on solar energy and other renewable energy sources, as well as links to other organizations.

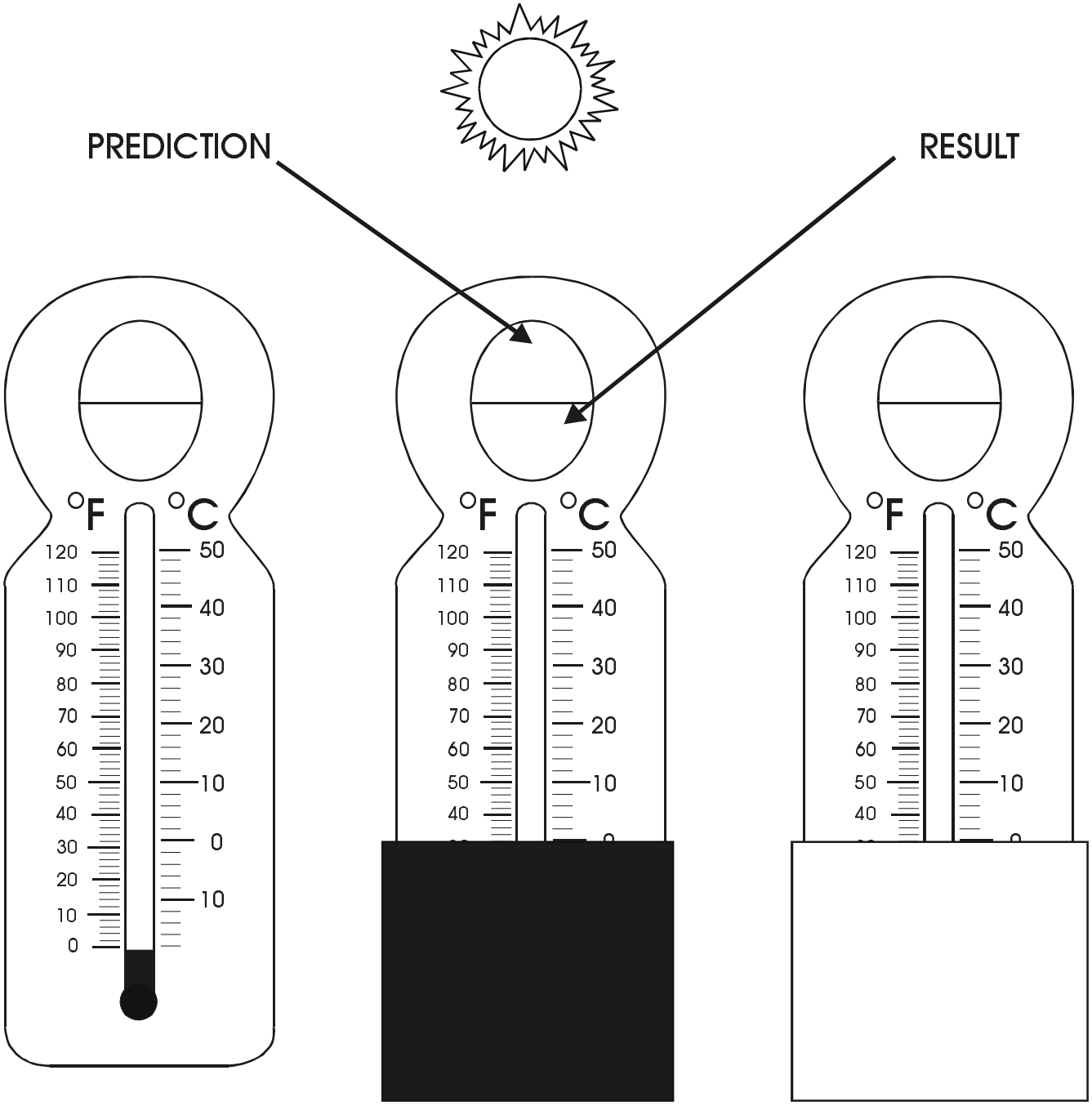
www.nsta.org / programs / tapestry: Get an application for a Toyota Tapestry Grant for Teachers on this website or by calling 1-800-807-9852. This year the Tapestry program is offering mini-grants of $2,500 in addition to the larger grants of $10,000. The smaller grants give teachers the opportunity to submit ideas for projects that have an impact on their schools with an easier application process. Application deadline is January 17, 2002.

www.hydro.org / waterworks: The National Hydropower Association has a teacher's guide entitled *Water Works: A Question of Balance* on the website. Designed for students in grades three through eight, this curriculum teaches about hydropower's role in providing electricity.

PRIMARY ENERGY ACTIVITY: Energy from the Sun

When solar energy hits objects, some of the energy is reflected and some is absorbed and changed into heat. Some colors absorb more solar energy than others.

Step 1: Put three thermometers in a sunny place.
Step 2: Cover the bulb of one with black paper. Cover the bulb of one with white paper.
Step 3: Predict which thermometer will get hottest. Number them 1-3, with 1 as the hottest.
Step 4: Wait five minutes.
Step 5: Record your results by coloring the tubes of the thermometers.
Step 6: Look at the results and number the thermometers 1-3 with 1 as the hottest.
How well did you predict?



ELEMENTARY **EXPLORATION: Solar Collectors**

Solar collectors absorb radiant energy, convert it into heat and hold the heat.

PURPOSE: To explore solar collection.

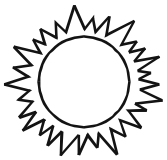
MATERIALS: 4 plastic containers, black & white construction paper, water, thermometer, plastic wrap, rubber bands, scissors

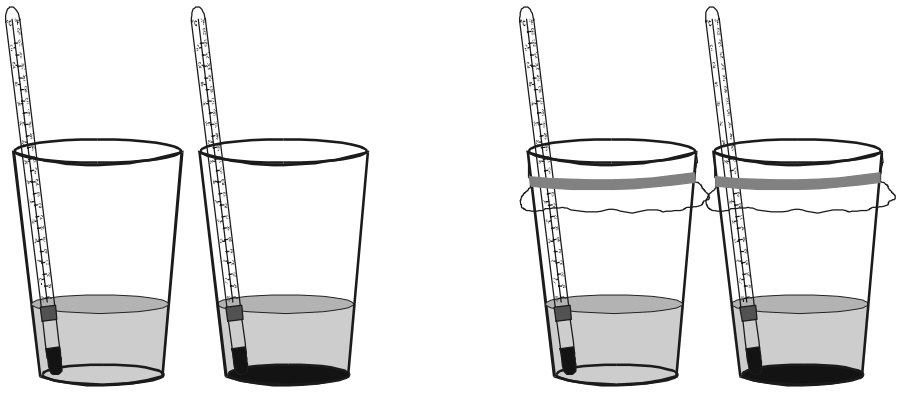
Step 1: Cut two circles each of white and black construction paper to fit the bottom of the containers. Place the circles on the bottom of the containers and cover with 100 ml of cold water. Record the temperature of the water.
Step 2: Cover one black and one white container with clear plastic wrap held in place with rubber bands.
Step 3: Place the containers in a sunny place so that the sun is directly over the containers. Record the temperature of the water after ten minutes.
Step 4: Calculate and record the changes in temperature.

RECORD THE DATA

	WHITE NO COVER	BLACK NO COVER	WHITE WITH COVER	BLACK WITH COVER
Original Temperature-C				
Temperature-C After 10 min				
Change in Temperature				

CONCLUSIONS: Look at your data. What have you learned about collecting solar radiation?





INTERMEDIATE **ACTIVITY: Solar Cooking**

GOAL: To build a solar hot dog cooker and test its ability to function.

MATERIALS PER STUDENT:

- ☐ 1 Pringles Potato Chip Can
- ☐ 1 Scissors or Exacto Knife
- ☐ 1 Wooden Skewer (14")
- ☐ 1 Piece of Transparency Film (8" x 4")
- ☐ 1 Hot Dog
- ☐ Tape

PREPARATION:

1. Prepare a set of materials listed above for each student.
2. Make a copy of these instructions for each student.

STUDENT PROCEDURE:

1. Radiant energy from the sun can be reflected and concentrated on an object. Much of the radiant energy absorbed by an object is converted into thermal energy (heat). Radiant energy can pass through clear materials much more easily than thermal energy.
2. Cut the Pringles can as shown in Diagram 1. Bend back the flaps but do not remove from the can. They will be used to reflect radiant energy onto the hot dog.
3. Cover the opening on the inside of the can with the transparency film and tape the film into place.
4. Make small holes in the metal end of the can and in the plastic lid. Remove the plastic lid from the can.
5. Put a hot dog onto the skewer, slide the skewer into the can, and place the end of the skewer through the hole in the metal end. Put the plastic lid back on the can, fitting the other end of the skewer through the hole. The hot dog should be suspended in the can as shown in Diagram 2.
6. Place the Solar Hot Dog Cooker into direct sunlight, positioning the flaps so that they will reflect radiant energy onto the hot dog. Remember that the angle of incidence of light equals the angle of reflection.
7. Time how long it takes for your hot dog to cook. If it is a very cold day, consider how you might insulate your cooker to improve energy efficiency.
8. Will your cooker work in artificial light? Experiment with a powerful artificial light such as an overhead projector.

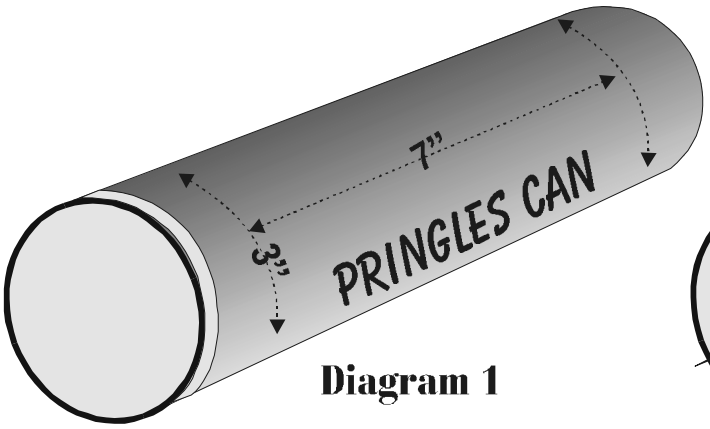


Diagram 1

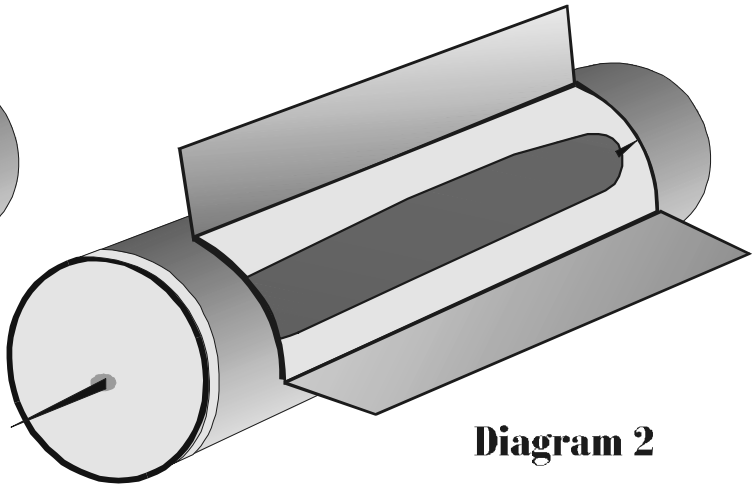


Diagram 2

Aftermath: The Economic and Energy Impact of September 11

Summarized from an October 4, 2001, report by Cambridge Energy Research Associates

The tragic events of September 11 have the potential to change the world's geopolitical framework, the ways that people live and conduct business, and the assumptions on which we operate.

As the economy reacts and the United States wrestles with how to respond to the attacks and protect its citizens, the possibility exists for a significant shift from globalization and economic integration toward an emphasis on domestic security and, in practical terms, a slowing or even reversal of trade liberalization.

IMPACT ON THE U.S. ECONOMY

The following indicators will determine the path the U.S. economy will take over the next year:

Continuing Function of Markets and Systems: The financial markets and transportation systems must recover and continue to function to ensure economic stability.

Demand for Goods and Services: Even a small decrease in consumer spending and residential construction would indicate a recession for the U.S. economy because they have been the main sources of support in the economy.

Economic Forecast for the United States: The disruption and lost output in the second half of September—losses in trading in financial markets, tourism, transportation and consumer buying—will be enough to move the third quarter economy into a downturn. The contagion of these factors is likely to turn the fourth quarter of 2001 into a negative quarter of about minus one percent. In the longer term, the increase in military spending and the rebuilding in New York City could have an upward effect on economic growth. But an economic upturn will depend critically on a marked change in public and consumer confidence.

EFFECT ON ENERGY MARKETS

Crude Oil: Downward revisions in the outlook for oil demand based on the effect of September 11 on economic performance and jet fuel demand point to the potential for oversupply in 2002 unless OPEC acts to curtail production.

Refined Products (gasoline, jet fuel, heating oil): The weak demand picture points to lower refined product figures, although one mitigating factor is that global inventories are low.

Natural Gas: Price weakness, growth in domestic and imported gas supply, and a strong storage position, combined with the potential weakness in the U.S. economy, are likely to dampen U.S. natural gas demand.

Exploration & Production: Changes likely to be experienced by E&P companies are related to security and economic concerns:

Programs in existence: Ongoing programs in areas perceived as politically stable will continue. However, a slowing global economy, exacerbated by economic repercussions from the September 11 attacks, will make production growth targets difficult to reach.

Development programs: Shifting perceptions of risk increase the potential for non-OPEC and non-Middle East OPEC countries to play a greater role in contributing to global growth. West African petroleum and extra-heavy oil in the Americas will benefit from any shift in investments, potentially increasing the pace of development in these areas.

Electric Power: The outlook for the North American electric power industry faces decreasing demand, lower prices and increased operating costs into 2002. Key issues facing the North American power industry include:

A new focus on energy security: A shift is likely from thinking of energy security in terms of U.S. reliance on foreign oil to include a focus on U.S. domestic infrastructure. This will alter, and potentially even forestall, the debate over electric industry deregulation and restructuring.

Infrastructure security: Heightened security around key generation, transmission and distribution facilities will translate into higher electricity costs.

Electric transmission: System planners will want to ensure the security of electric transmission systems—both physical assets and information systems used by grid operators—by putting double and even triple contingencies in place.

Cambridge Energy Research Associates is a leading advisor to major international companies, financial institutions and organizations, delivering strategic knowledge and independent analysis on energy markets, geopolitics, industry trends and strategy. For more information, go to ***www.CERA.com/news/crisis****.*

Short Circuits

Fuel Prices for Winter

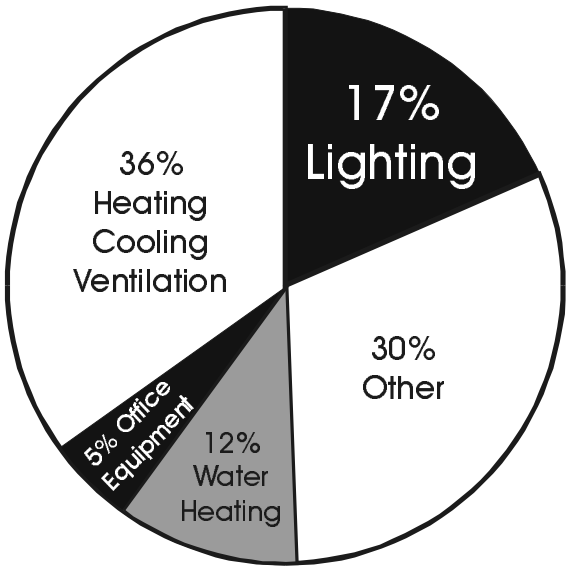
The Energy Information Administration is forecasting lower heating bills this winter. Assuming normal weather conditions, EIA predicts that residential consumers will pay an average of $170 to $320 less for fuel. The inventories of heating fuels—especially natural gas—are above normal levels this year and crude oil and natural gas prices are lower. Last year's temperatures were about seven degrees Fahrenheit colder than normal.

Lighting the Way to Energy Efficiency

An entire city block along Telegraph Avenue in Berkeley, California, has switched to energy-efficient fluorescent lighting, cutting its projected electricity usage by nearly half. The upgrades were part of the "Phillips Lighting Formula: An Education Blueprint for the Nation" from Phillips Lighting Company. The educational program is intended as a model for energy conservation, illustrating how small changes can result in dramatic savings. Phillips and Amtech Lighting first conducted a lighting audit of each building to determine the most efficient lighting options, then donated the products and installation services for the retrofit.

If the buildings in New York City's Times Square took the same steps, it would save $5.8 million a year, the Strip in Las Vegas would save $8.4 million a year, and the Inner Harbor in Baltimore would save $168 thousand a year. Lighting is the second-largest energy-using system in commercial buildings, after space heating, cooling, and ventilation.

At home, replacing just one incandescent bulb with a comparable compact fluorescent saves at least $26 and reduces energy consumption by 75 percent over the life of the bulb.



BUILDING SYSTEM ENERGY USE

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