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# A History of Supporting Our Future Leaders

**A**t CAEC, we take great pride in providing value to all of our members, regardless of their age. When it comes to our youngest consumers, we aim to provide a wide variety of educational programs to aid them in their journey of becoming our future leaders. Whether it's from safety demonstrations, scholarships for graduating high school seniors or by sponsoring local sports groups, school organizations and community events, your co-op is dedicated to enhancing our communities by investing in our youth.



All of our youth programs are important; however, one of my favorites is the Bright Ideas Grant Program because it impacts so many students. CAEC has offered the Bright Ideas Grant program for the last 16 years. During this program's tenure, it has reached nearly 100,000 students in our service area by allowing educators to offer hands-on learning activities funded by these grants.

Our employees enjoy working with teachers and students throughout the school year as they perform safety demonstrations, make energy efficiency presentations to groups, and participate in career fairs.

This year marks the 50th anniversary of another beneficial program unique to cooperatives—the Rural Electric Youth Tour. This experience allows more than 1,500 high school students from across the country to absorb Washington, D.C., learn about government, history and the role of electric cooperatives. CAEC selects four representatives to participate in the Washington Youth Tour from a group of high school juniors who first participate in the Montgomery Youth Tour where they learn the importance of legislation and leadership on the local level. Many students who have participated in this program have gone on to become successful leaders in their communities and in the world of business.

Another program we facilitate is the college scholarship program. Each year we award two, \$1,500 scholarships to member-dependent graduating seniors. By helping students further their post-secondary education, we are making a significant investment for when they return to serve as future leaders and as part of an educated workforce in our communities.

The Cooperative difference means having a concern for our communities and providing good value. Benjamin Franklin said it well: "An investment in knowledge pays the best interest." Through the continued investments we all make in the youth of today, we will have a great impact on our area's future. ■

*For more information on any of these programs, visit us online at [caec.coop](http://caec.coop).*



# High School Juniors: Experience Leadership Firsthand through Youth Tour

Join more than 1,500 fellow young leaders from across the country for a week in June 2015 as part of the annual NRECA Electric Cooperative Youth Tour in Washington, D.C. As a CAEC Youth Tour representative, visiting with congressional representatives at the U.S. Capitol to share your perspective is just one of many rare opportunities you will experience.

Each year, CAEC selects high school juniors from public, private or home schools to participate in three once-in-a-lifetime opportunities for leadership training: the Montgomery Youth Tour, the Youth Leadership Conference and the Washington Youth Tour. Each part of the Youth Tour and Leadership program offers lasting memories and experiences. The following is a description of each Youth Tour activity.



**Montgomery Youth Tour:** Learn more about our state's capital, government and history during a unique experience allowing you and fellow students from across Alabama to tour state buildings, the Civil Rights Museum, the Rosa Parks Museum and more. You will also meet state representatives and other elected officials and talk about issues that concern you as well as participate in leadership training activities.

**Youth Leadership Conference:** Held at the 4-H Center in Columbiana, Ala., students participate in leadership exercises and learn about the many important roles cooperatives play.

**Washington Youth Tour:** A few applicants will be selected through an interview process to fly to D.C. and tour monuments, federal buildings and other exciting landmarks. This is also a great opportunity to meet other youth leaders from across the country and members of your Congressional delegation. ■

Applications are available at [caec.coop](http://caec.coop) or call us at (800) 545-5735, ext. 2125. Deadline is Dec. 5

## Grants Available to Fund Classroom Projects

From creating robots to exploring underwater creatures, grants from CAEC's Bright Ideas Grant Program have given educators opportunities to provide an excellent learning experience for students in creative ways. The grant program provides funding to teachers annually in order to support valuable, hands-on initiatives and activities designed to stimulate students' imaginations and desire to learn. Bright Ideas grants assist teachers in public, private and

home schools within CAEC's service area.

Teams of teachers or individual teachers can apply for funding through a simple application process. Individual teachers can apply for grants from \$250 to \$750, while teams of teachers are eligible for grants up to \$1,500. Just think what that could mean for your students.

The deadline to submit an application is Nov. 21. For more information or an application, visit [caec.coop](http://caec.coop) or call (800) 545-5735, ext. 2125. ■



# Nuclear Power: Generating Clean Energy

**A**s America looks for clean energy solutions, there is one form of efficient, clean power production that our nation has not actively explored for the last 57 years—nuclear. Compared to other countries using nuclear power production more readily, the U.S. currently has only 62 commercially operated nuclear power plants with 100 nuclear reactors in 31 states in operation. Each nuclear power plant typically employs 400 to 700 people.

Although nuclear power is efficient, it takes many steps to get it into a usable form of energy for distribution to homes and businesses. Below we look at what it takes to use a fuel, such as uranium, and to convert it into electricity for your home.

## Mining

The production of nuclear power begins in the mines—where miners search for uranium ore which serves as the fuel for nuclear power production.

Uranium miners use several techniques to obtain



Mining photo courtesy of COGEMA,

this chemical element: surface (open pit), underground and in-situ leach mining. Underground uranium mining requires the same basic steps as required

for any other type of mining—such as coal.

be used by power plants. Natural uranium is composed of two types: U-235 and U-238. Only U-235 is capable of being used for energy production, but it only makes up less than one percent of natural uranium. So, for uranium to be used for fuel in a nuclear power plant, the range of U-235 must be raised or “enriched” into a gaseous state.

To understand how enrichment works, picture the gaseous molecules as sand particles suspended in air. All molecules are blown through thousands of filters or sieves, one after another. Because the lighter U-235 particles travel faster than the heavier U-238 particles, more of them penetrate each sieve. As more sieves are passed, the concentration of U-235 increases. The process continues until the concentration of U-235 is raised, or enriched, to 3-5 percent.

## Milling

After uranium ore is removed from the ground, it must be processed by “milling,” which involves a sequence of physical and chemical treatment steps. The final product of milling creates yellowcake (named for its powdery texture and yellowish color).



Yellowcake photo  
courtesy of NEI

## Conversion and Enrichment

The drums of yellowcake must go through yet another process to be transformed into a fuel that can

## Fuel Fabrication

Before it can be made into nuclear fuel, however, the enriched uranium fluoride gas is changed to uranium dioxide—a solid. Then it is pressed into ceramic pellets the size of the tip of a person’s little finger. The fuel pellets are inserted and stacked end to end into slender, heat-resistant metallic tubes, or fuel rods which can range in size from 12-17 feet tall. The fuel rods are combined to form fuel bundles and on average, 157 fuel bundles (each weighing approximately 1,450 pounds) are loaded into each reactor core.



Fuel pellet photo  
courtesy of NEI

# Power Generation

When the fuel bundles are placed in the reactor, it is the process of the uranium atoms splitting as they are bombarded with free neutrons—also known as fission—that creates energy which is given off as heat. However, control rods made of the chemical element boron are placed into the fuel bundles to slow down or altogether halt the fission of the uranium atoms, giving the power plant the ability to precisely control the amount of heat given off.

The heat that is produced through fission is sent to a Pressurized Water Reactor (PWR) where it heats water to 500°F but does not allow it to boil, much like a pressure cooker. Steam generators then take river water and run it against pipes that contain the PWR heated water to convert the river water into steam. The steam is then sent to turbines to begin the electricity power production process. Afterward, the steam is released through cooling towers.

## Disposal

In one year a typical nuclear power plant generates 20 metric tons of used nuclear fuel. The nuclear industry generates a total of about 2,000 metric tons of used fuel per year. During the past four decades, the entire industry has produced about 60,000 metric tons of used nuclear fuel.

Most U.S. nuclear plants store waste either through on-site dry storage or a spent fuel pool. Since water is a natural radiation barrier, spent fuel is loaded into airtight steel or concrete-and-steel containers, known as casks, and then carefully delivered to a steel-lined, concrete pool of water for storage.

On-site dry storage is done in a similar manner, with the used fuel being



Fuel bundle photo courtesy of TXU Electric

placed into engineered concrete and steel casks that are set on a special pad. Each cask can weigh 300,000 pounds and is strong enough to take a hit from a fast moving truck or even a train without any damage.

Other countries, such as Japan, Russia and those in Europe, reprocess used spent nuclear fuel by separating uranium and plutonium from the waste products of fuel rods and then re-enrich the recovered uranium to be used again as fuel.

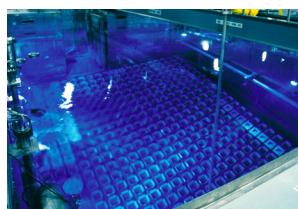


Dry storage photo courtesy of Surry

## Safety First

U.S. nuclear plants are well-designed, operated by trained personnel, defended against attack and prepared in the event of an emergency.

In addition to backup systems that monitor and regulate what goes on inside the reactor, U.S. nuclear power plants also use a series of physical barriers to prevent the escape of radioactive material. Everything from the fuel pellets to the fuel rods are encased in materials that limit radiation exposure. All of these items are further contained in a massive reinforced concrete structure—called the containment—with walls that are four feet thick. The lack of a containment structure is what helped lead to the failure of the Chernobyl plant in Russia, something that cannot happen in the United States since all plants are required to have containment structures and other safety features.



It takes many steps to generate electricity produced from nuclear power. However, nuclear power allows us to have a clean, alternative energy source. When you take into account the planning process which includes meteorological, seismic and population studies, it can take up to 10-15 years to build a nuclear plant, from planning to operation. But in doing so, an efficient energy source can be found in nuclear power. ■

# What Can an Energy Audit Find in Your Home?

**E**d Boardwine knew his heating and air unit was having some issues. Each year it seemed the older unit was working harder and running longer to cool and heat his home, and when he saw an advertisement for the Energy Audit program offered by CAEC, he decided to see if it could aid him in making the right decision when purchasing a new unit.

"I knew I needed to replace my old unit, it was using more energy but it wasn't keeping my home the temperature I desired it to be," Boardwine said. "With the energy audit, I could gain the information I needed to ensure I purchased the right size unit, and also learn some valuable information about energy leaks in my home."

He arranged for an Advanced Energy Audit by a CAEC Energy Services Representative (ESR) and certified residential energy auditor.

The audit included an inspection for visible holes and gaps from inside the home to the outside using an infrared (IR) camera, inspecting attic insulation for proper installation, examining ductwork for

leaks, checking for phantom loads (power consumed by electronics while they are switched off, but are still plugged into an outlet, such as a cell phone charger) and a blower door test, which helps the ESR find the precise locations of air leaks and determine how much air is entering and exiting the member's home.

In just a few hours, the blower door test showed that the home had enough leaks to be equivalent to having an 2 X 3 ft. hole, or an open window in the home, letting climate controlled inside air out and hot or cold outside air in.

"I knew in addition to my heating and cooling unit, I might have some air leakage and insulation issues, but the ESR showed me areas I didn't even know were problems. When I saw the evidence of just how much of my energy dollars I was literally throwing out the window, it was a real eye-opener for me."

Through the ESR's recommendations, Boardwine replaced his unit with a 21-SEER heat pump (and received a rebate through our Heat Pump Rebate Program) and also invested in foam insulation to be sprayed in the attic and under the home to aid in sealing the air leaks. Some of these improvements can get pricey, but members can also apply for funding through CAEC's Efficiency Loan Program to help cover many of the suggestions made by our ESRs.

Since making these changes, he said his power bill had been reduced by 40 percent. In addition, he noted how inexpensive the audit was and once he made the recommended changes, he received a refund of the audit price.

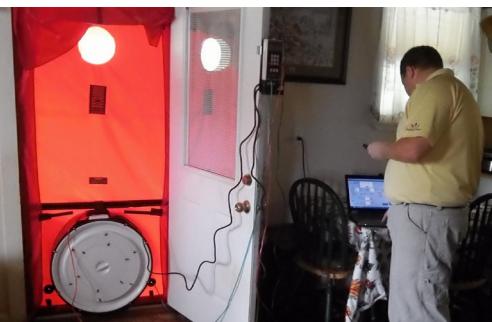
The Advanced Audit is \$100 and the Basic Audit, which includes everything except the blower door test, is \$75. Either audit is refundable after the member makes the suggested corrections identified by the ESR and presents receipts. Members have up to one year to complete the recommendations in order to be eligible for the refund.

"I would tell anyone to have an audit done. It's not a contractor trying to make a sale, it's expert advice showing you how much energy you might be wasting in your home."

To learn more about the program, or to set up to have an energy audit identify problem areas in your home, call 1-800-545-5735 or visit [caec.coop](http://caec.coop).



Boardwine says the foam insulation suggested has helped in lowering his energy bill.



CAEC's Energy Auditor performing a blower-door test to determine the amount of air leakage at Boardwine's home.

# A \$16,000 Investment in Education...

## ...Imagine the Possibilities!

How could \$16,000 help children in the classroom? The Bright Ideas Grant program from Central Alabama Electric Cooperative gives teachers the chance to explore the possibilities.

CAEC has given \$16,000 in grants each year to support innovative, creative and effective initiatives that cannot be covered by traditional funding. Designed for K-12 teachers in public, private and home schools within CAEC's territory, the program has given approximately \$240,000 benefiting nearly 100,000 students since its inception in 1998.

Teams of teachers and individual teachers are eligible to apply for the grant monies. Individuals are eligible to apply for grants from \$250 to \$750, while teams are able to apply for up to \$1,500.

Don't miss this opportunity for your child's classroom. Mention CAEC's Bright Ideas grant program to your child's teacher or cut off the information below and have your child present it to his or her teacher.

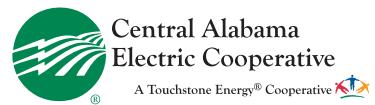
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*Receive up to \$750 for your classroom. Please contact CAEC about their Bright Ideas Grant Program.*

CAEC offers teachers up to \$750 for classroom projects. Teams of teachers can receive up to \$1,500. For more information, call (334) 351-2125/(800) 545-5735 ext. 2125 or e-mail [communications@coop.caec.com](mailto:communications@coop.caec.com).

*Applications available at [www.caec.coop](http://www.caec.coop)*

**Deadline is Nov. 21, 2014**



# Enjoy a Hot Shower and Help Control Costs at the Same Time



By having a CAEC Peak Shaving Device installed on your electric water heater, you'll still have hot water when you need it, while helping the cooperative reduce its need to pay for peak-time power costs.

If enough people join this effort, we can have a positive effect on our future rates. Will you join us?

The peak shaving device for your electric hot water heater is free, and will be installed by a licensed electrician at no cost to you just by submitting the form below.

To learn more about this program, visit us at [www.caec.coop](http://www.caec.coop).

Yes, I agree to do my part by joining CAEC's peak shaving program.

Name: \_\_\_\_\_ Phone #(s): \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ St: \_\_\_\_\_ Zip: \_\_\_\_\_

Account #: \_\_\_\_\_

Email: \_\_\_\_\_

Number & Size(s) of Water Heater(s): \_\_\_\_\_

