

Arkansas

Focusing on sustainable, cutting-edge & renewable energy alternatives

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Bringing You the Latest on Energy Efficiency, Renewable Energy and Energy Policy

We are pleased to bring you the first issue of Energizing Arkansas. This quarterly publication is a joint education project of the Arkansas Energy Office of the Arkansas Economic Development Commission and the University of Arkansas Division of Agriculture's Public Policy Center. Our goal is to provide timely, informative articles on the development of energy efficiency, renewable energy and energy policy in Arkansas. Energizing Arkansas will explore new research and technology in the bioenergy sector, examine the economic, environmental and policy impacts of bioenergy and spotlight people and organizations leading the pack in renewable energy in the state.

This inaugural issue is dedicated to showcasing renewable energy in action. We will highlight how two net metering homeowners are generating energy and feeding it back into their utilities' metering grids. Another piece tells how methane capture is turning community landfills into renewable energy stars. Regular features will include "Trend Watch," which tracks the latest activities in the world of renewable energy, and a column with updates on current and potential public policy issues.

Electronic versions of Energizing Arkansas as well as an accompanying podcast highlighting one of the stories featured in each issue are at www.arkansasenergy.org or at ppc.uaex.edu.

We welcome your questions and encourage your comments. Please send all correspondence to Public Policy Center, 2301 S. University Avenue, PO Box 391, Little Rock, AR 72203 or e-mail energizingarkansas@uaex.edu.



Innovative Arkansans are generating energy and feeding it back into their utilities' metering grids.



Chris Benson
Arkansas Energy Office
Arkansas Economic
Development Commission

Tom Riley
Public Policy Center
University of Arkansas
Division of Agriculture

Greening the Grid with Net Metering

Mike Mills is an energy pioneer. Back in 2005, the owner of the Buffalo Outdoor Center in this remote Newton County town became the first person in the state to erect a wind generator and connect it to the local electric company's grid.

"Every time the wind blows, I hear the sound of money," Mills said, smiling at his 10-kilowatt (kW) wind generator that resembles a brightly colored model airplane suspended atop a 100-foot tower. Mills estimates that the generator produces approximately 8,000 kilowatt hours (kWh) a year. "My house is 1,800 square feet and it takes care of about two-thirds of what we need to run the home year-round."

Federal and state net metering laws allow Mills to connect his wind generator to the transmission grid used by the local utility company – Carroll Electric Cooperative Corporation – and receive retail credit for the electricity he supplies. With net metering, customers use the electricity they generate first, reducing what they would normally buy from the utility. If customers generate more electricity than they use, the excess turns the electric meter backwards and the electricity goes onto the grid.

As of May 2008, 42 states and the District of Columbia have net metering programs. Each state oversees net metering regulations and the process under which a generator can connect to the grid.

In 2001, the Arkansas General Assembly charged the Arkansas Public Service Commission (PSC) with establishing net metering rules for eligible renewable-energy systems. Technologies deemed eligible by the PSC include solar, wind, hydroelectric, geothermal electric and biomass systems, as well as fuel cells and microturbines using renewable fuels. Subsequent legislation enacted in April 2007 strengthened the law by increasing the availability of net metering and allowing net metering customers to carry over any net excess generation (NEG) credits to their following monthly bill at the utility's retail rate. Residential renewable-energy systems up to 25 kW in capacity or non-residential systems up to 300 kW in capacity are all eligible for the Arkansas net metering program.

"Prior to the 2007 amendment to the law, net metering customers only received credit over the monthly billing cycle. If a customer produced more energy than they used, there was not an option to carry that credit forward," said Jenny Ahlen, renewable energy programs coordinator at the Arkansas Energy Office. "The change now allows customers to bank their NEG credits over a 12-month period."

Nestled in a valley within the Ozark National Forest, Howard Payne takes advantage of the abundant sunlight to offset electricity costs. Payne, a self-described tinkerer, has slowly built enough electrical capacity to connect to his local utility provider, Arkansas Valley Electric Cooperative.

"I started out with old batteries and an inverter that I bought from Wal-Mart and put things together one piece at a time," Payne said.

Today, he has a bank of three solar panels and an



Independent producers of renewable energy are interconnected with their electricity costs and protect the environment by reducing the



Howard Payne, a net metering customer, believes a combination of education and incentives is needed to increase the use of renewable energy in the state.

inverter that allows his system to be integrated with the grid. A utility-grade inverter converts direct current (DC) power from solar modules into alternating current (AC) power that exactly matches the voltage and frequency of the electricity flowing in the utility line. In the event of a power outage, the inverter automatically disconnects the solar system from the line. This safety measure protects utility repair personnel from being shocked by electricity flowing from the solar system into what they would expect to be a “dead” utility line.

“I’ve been connected for a year and I’ve been pleasantly surprised,” Payne said. “I’m producing about 200 to 300 kWh a month.”

However, Payne added, “It will be 25 years before I see a return on my investment. The power companies can produce electricity at a much lower cost than is possible through individual production.”

(continued pg. 4)

Is Net Metering an Option for You?

Net metering is available to Arkansas residential or commercial consumers who generate electricity from a renewable source. Getting started requires considerable thought and research, but there are helpful resources available. Here are the initial steps for getting started in net metering:

1. Maximize your energy efficiency.

Before you consider installing a renewable energy system, make sure you have maximized the energy efficiency of the structure. Not only will this save you money on your monthly utility bills, it will also decrease the size and cost of the renewable energy system you install.

2. Find out more about the process.

The first step is to contact your local utility company's meter department. It can provide details about the technical requirements, the approval process and how to obtain an interconnection (i.e., net metering) agreement.

3. Investigate your renewable options.

Information is available from a range of sources, including the Arkansas Energy Office and local consultants and vendors. A qualified supplier will be your key source of information about the most suitable option for you. If you are in an urban setting, a solar system may work best since wind turbines may not be permitted given space requirements and local zoning ordinances. Wind may be a more viable option in rural locations with adequate wind resources.

4. Determine what size system you need.

To size your system, identify your individual energy requirements. The average household in America consumes 10,656 kilowatt-hours (kWh) per year according to the Department of Energy. You can use your previous bills as a starting point.

For more information and a list of local renewable energy vendors, contact the Arkansas Energy Office Hotline at 1(800) 558-2633, (501) 682-7319 or visit the Arkansas Energy website at www.arkansasenergy.org.



utility power grids, helping lower use of fossil fuels.

Arkansas Wind Working Group

Arkansas has established a Wind Working Group to identify opportunities and barriers related to the development of wind energy.

The first meeting was held in June with more than 40 individuals and organizations represented, including public utilities, state agencies, the research and policy communities, environmental groups and the manufacturing sector. The Group provides a forum for exchanging information and discussing policy and economic options for encouraging the development of wind energy in the state.

“Adding wind power allows Arkansas to diversify its energy portfolio, which, in turn, helps minimize supply disruptions and stabilize the cost of electricity,” Tom Riley, director of the UA Division of Agriculture’s Public Policy Center, said.

Wind energy also has the potential to stimulate the economy by generating \$21 million for local communities from new jobs and tax revenues, according to Larry Flowers, an engineer with the National Renewable Energy Laboratory in Colorado.

The subcommittees within the Wind Working Group are:

- Small and Community Wind Development,
- Commercial Wind Development,
- Policy and Legislation,
- Education and Outreach, and
- Manufacturing.

The subcommittees meet regularly. Those interested in developing wind energy in the state are encouraged to participate in the Wind Working Group. For more information, contact Jenny Ahlen, renewable energy programs coordinator at the Arkansas Energy Office, at energizingarkansas@uaex.edu or (501) 682-2460.



A diverse group of citizens as well as public and private groups work together to advance the development of wind power through the Arkansas Wind Working Group.

Net Metering

(continued from pg. 3)

A tax credit offered by the federal government for the installation of solar systems will expire on Dec. 31, 2008. Arkansas currently does not offer any financial support or incentives to encourage the use of renewable energy systems.



Mike Mills’ wind turbine has garnered interest from curious passers-by. The turbine generates enough electricity to take care of two-thirds of Mills’ household power needs.

Mills agrees that it will be several years before he sees a return on his \$30,000 wind generation system. “But what are electricity prices going to do?” he said. “While electricity costs will continue to increase, the price of renewable energy systems will start decreasing, as more people become educated about their benefits.”

In addition to helping residents and small businesses lower their electricity costs, installing renewable energy systems helps protect the environment by reducing the use of fossil fuels. There are also potential benefits to utility companies. Net metering allows utilities to obtain electricity from small, distributed residential sites or small business sites that they don’t have to generate themselves or purchase on the market. This distributed generation can potentially strengthen the distribution grid, especially in rural areas.

There are approximately 25 net metering customers across the state, but interest is growing. “Net metering is slowly entering the mainstream vocabulary. It’s not so much a novelty now, but rather a realistic and increasingly attractive option for homeowners and small businesses,” Ahlen said.

The Food, Conservation, and Energy Act of 2008, commonly referred to as the Farm Bill, was enacted into law in June 2008. With 15 titles, it will govern federal agriculture and energy-related programs until 2012.

The Farm Bill builds upon the first-ever Energy Title of the 2002 Farm Bill, providing new programs and a stronger federal commitment to farm-based energy. The total mandatory funding for the Energy Title is \$1.12 billion, which compares to \$800 million in the 2002 Farm Bill. However, comparing the 2002 and 2008 Farm Bills is not “apples to apples” – program funds are now allocated differently and some would say more favorably. For example, mandatory funding for the Rural Energy for America Program (REAP) (formerly the Section 9006 program) more than doubled from \$115 million to \$255 million. And this money is over four years rather than five as in the last Farm Bill. Separately, the Farm Bill also includes \$400 million in cellulosic ethanol tax credits.

Additional highlights in the Energy Title are:

- new funding for energy audits on farms,
- new cellulosic ethanol biorefinery financing,
- energy crop incentives for growers, and
- new funding for converting fossil fuel power to biomass.

Other programs with mandatory funding include:

- production payments for advanced biofuels,
- biomass research and development,
- biobased markets development, and
- public education on biofuels.

Several of these programs also have authorizations for additional discretionary funding. Such funding will need to be secured each year through the annual appropriations process. Other programs in the Energy Title – for example, a study on the production of fertilizer from renewable energy – are entirely contingent on obtaining discretionary funding through the annual federal appropriations process.

“The Farm Bill includes a significant clean energy development component – improved and new programs for wind power, advanced biofuels, energy efficiency, solar power and new energy crops for cleaner energy from America’s farmers, ranchers and rural businesses,” Tom Riley, director of the University of Arkansas Division of Agriculture’s Public Policy Center, said. “All of the rules are not yet written, but this Farm Bill has the potential to be of broad economic and environmental benefit to Arkansas’ farms and rural communities.”



Transforming an Environmental Liability Into an Energy Asset

Two Pine Landfill is turning yesterday's waste into tomorrow's energy. The landfill, located in Pulaski County, operates a state-of-the-art gas conversion plant that supplies electricity to approximately 4,500 homes in North Little Rock.

According to the Environmental Protection Agency (EPA), every American produces, on average, 4.6 pounds of garbage a day. Much of the trash ends up in landfills, where it decomposes and produces methane and carbon dioxide. Both are greenhouse gases, which are widely believed to contribute to climate change.

"Methane gas, a component of natural gas, is a potent gas that remains in the atmosphere for about 9 to 15 years. Methane is about 21 times more powerful at warming the atmosphere than carbon dioxide. If landfills can capture methane and use it as an energy source, it makes sense to do so," said Suzanne Hirrel, associate professor and waste management specialist at the University of Arkansas' Cooperative Extension Service.

Federal and state environmental laws mandate that landfills must monitor their methane production and prevent landfill gases from being released into the atmosphere when

they exceed permitted levels. The Solid Waste Management Division of the Arkansas Department of Environmental Quality (ADEQ) regulates activities and facilities involved in the processing and/or disposing of

solid waste. Most landfills use a flare system or other combustion device for disposing of landfill gases. This process reduces odors, addresses safety concerns, reduces methane emissions and air pollution but does not provide energy benefits.

There are many ways to generate energy from landfill gas. The gas from the landfill can generate electricity, heat water into steam, be converted to fuel for vehicles or purified to be used in natural gas pipelines. The Department of Energy Act of 1977 created the U.S. Department of Energy, which was authorized to fund and regulate waste-to-energy research

projects and energy research. Federal tax credits enacted in 1980 encouraged the development of private enterprises



(top) The Two Pine Landfill accepts waste from Jacksonville, Sherwood, Cabot, Conway, rural Pulaski County and as far away as Garland County. (bottom) Six engines convert 500,000 tons of waste annually into electricity for North Little Rock residents.

TREND WATCH



Two Pines' methane digester has been in operation for two years. The landfill regularly schedules tours of the facility.

to participate in the landfill gas market. A federal production tax credit of one cent per kilowatt hour is available for energy produced from landfill gas.

David Conrad, an engineer for Waste Management, which operates Two Pine, said the landfill is the only one in the state that generates electricity from landfill gas. There are six Caterpillar engines located at Two Pine that generate 4.8 megawatts of power from roughly 500,000 tons of garbage a year. ADEQ recently approved a 144-acre expansion of the landfill. Waste Management plans to build a second gas-to-energy plant on the new site, which should be operational in five years. In the meantime, the original plant will continue to supply electricity for many years to come.

According to ADEQ, EPA has identified four municipal solid waste landfill candidates for its Landfill Methane Outreach Program (LMOP). EPA defines a candidate landfill as one that is accepting waste or has been closed for five years or less, has at least one million tons of waste and does not have an operational or under construction project. Three additional Arkansas landfills have been listed by the EPA as having potential status, meaning the landfills may qualify for LMOP, but more data is needed before making a final determination.

There are several benefits to converting methane into energy. Such projects reduce annual greenhouse gas emissions by preventing landfill gas from being released into the atmosphere and help to lessen America's dependency on fossil fuel-based electricity.

"We are proud to be contributing to the renewable energy resources of the state. We plan to enlarge our capacity to produce even more electricity for Arkansas citizens. Converting landfill gas to electricity is a win-win situation for Two Pine, the communities we serve and the environment as a whole," said Conrad.

■ Bill Ball, owner of Natural Environments Inc., is developing a 35-home solar subdivision in Little Rock.

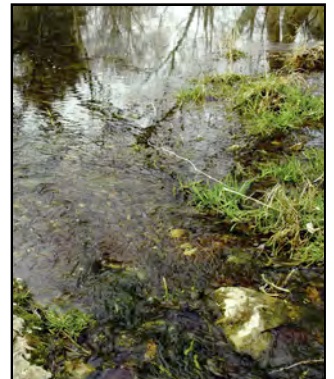
Plans for each home will be run through a software program that will determine how many solar panels are necessary to allow it to produce 50 percent or more of its electricity through solar power. The homes will range from 2,200 square feet to 4,000 square feet and must be built to at least Energy Star standards. The homes are priced between \$450,000 and \$650,000 and, according to Ball, will have monthly electricity bills averaging \$45 a month or less.

■ Investment in renewable energy could create 19,000 jobs in Arkansas.

A September report commissioned by the Center for American Progress suggests investment in renewable energy and energy conservation could create 19,500 jobs in Arkansas over the next two years. The report recommends creating a federal loan guarantee program to encourage private-sector investment in renewable energy. In addition, it suggests investing the money in six areas: solar power, wind power, next-generation biofuels, retrofitting buildings to improve energy efficiency, expanding mass transit and freight rail, and constructing "smart" electrical grid transmission systems to increase efficiency in energy distribution.

■ Students at the University of Arkansas are designing a sustainable future using algae from local streams.

UA received a grant from the National Science Foundation Research Experience for Undergraduates Program to fund a three-year project involving faculty from many disciplines working with students to initiate four projects. Each project is related to the other through the common thread of sustainable ecosystem design and management. One project involves taking water from a source that has adequate nutrients – phosphorus and nitrogen – and using that water to grow a community of wild algae for cellulosic and biodiesel conversion. Marty Matlock, associate professor in the department of biological and agricultural engineering in the UA Division of Agriculture, is the principal investigator.





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Arkansas AFV Odyssey Day

October 3, 2008, 10 a.m. – 1 p.m. • Winrock International, Little Rock, Arkansas

The Arkansas Clean Transportation Partnership will host the state's first Alternative Fuel Vehicle (AFV) Odyssey Day at Winrock International's headquarters. The nationwide event is coordinated by the National Alternative Fuels Training Consortium to raise awareness of alternative fuel vehicles and their contribution to sustainable energy efforts. The public is invited to view a variety of AFVs and attend a press conference with Gov. Mike Beebe and leading state policymakers. A roundtable discussion with biofuels industry experts is also scheduled. For more information, contact April Collister at (501) 280-3061 or acollister@winrock.org.

Arkansas Weatherization Day

October 30, 2008, 9 a.m. – 12:30 p.m. • River Market West Pavilion, Little Rock, Arkansas

Gov. Mike Beebe has officially proclaimed October 30 as Weatherization Day across the state of Arkansas. The Weatherization Assistance Program is the largest residential energy-efficiency program in the nation. Speakers and activities are scheduled. For more information contact, the Arkansas Department of Human Services at (501) 682-8715 or go to www.waptac.com.

Industrial Energy Assessments 101

November 5, 2008, 8:30 a.m. – 3:30 p.m. • DeGray Lake Convention Center, Bismarck, Arkansas

This seminar will provide the basic information needed to begin self-identifying opportunities to reduce system energy losses, boost efficiency and save energy and money. To register, go to www.mfgsolutions.org.