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*RENEWABLE ENERGY ANALYSIS PROJECT*

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Dr. Kate Shoulders, an assistant professor in the Agricultural Education, Communications and Technology Department at the University of Arkansas, is working alongside the University of Arizona Office for Sustainability, the Arkansas Energy Office and a branch of the Arkansas Economic Development Commission to highlight the potential benefits of renewable energy to farmers and other businesses in the agricultural industry.

The project helps visitors understand how renewable energy can be beneficial and shows them which system might work best for their needs. This is an important project because the more research and development that is done on renewable energy, the better prepared farmers will be when energy supplies are less abundant. Access to energy will always be a concern for farmers, and by allowing them to see what is available and what their best options are, farmers can know what their most energy-efficient options are.

The REAP energy stations set up at the University include on- and off-grid solar generators, a wind turbine, a solar/wind powered well pump and solar powered AC plugs.

The on-grid solar generator system aids in powering two classrooms in the Abernathy building. The system uses a one-kilowatt solar array generator, which combines renewable energy with electricity provided by the grid.

The system then uses a micro-inverter to measure how much energy each cell is producing over five-minute intervals. The purpose of this system is to illustrate how well solar panels work under varying conditions.

The off-grid solar generator is used to demonstrate an alternative method of delivering water to remote areas without having to build miles of pipelines and/or having to transport water by vehicles.

The solar panels connect a water pump to two troughs that hold water to simulate water troughs used on a cattle farm. The solar panels could also be used for other purposes such as a charging station for recharging power tools or as a water heater.

The wind turbine will be used to power a water pump that aerates a pond at the UA Experiment Station farm. The aeration will prevent algae from building up on the surface of the water and keep it oxygenated and fresh for cattle consumption.

The idea behind the wind turbine, according to Shoulders, is to demonstrate that wind power may not very efficient in northwest Arkansas, contrary to the many people who believe there is considerable wind in the region. The data from the turbine will help in documenting wind speed and direction, which may become useful if/when technological advances make wind turbines a more cost-efficient option.

Another wind turbine will be used in a wind and solar system to pump water from a well to the Savoy Beef Farm, where the water will be used at the cattle operation. This demonstration will show farm visitors how water can be transported in a more cost-efficient way, without the use of vehicles.

The solar powered AC plugs are a great way to demonstrate how renewable energy can be used in everyday domestic situations. The plugs will allow people to test different appliances with different energy requirements to see how they compare. For example, Shoulders will compare CFL light bulbs to LED light bulbs to see how many bulbs of each type the system will be able to power.