Solar powered water pump livestock

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By Mike Morris, NCAT Agricultural Specialist and Vicki Lynne, NCAT Energy Specialist; Updated by By Chris Lent, NCAT Agricultural Specialist

IntroductionCostSolar Pumping Technology--What You Need to KnowDesigning and Installing SystemsFrost-Free System DesignProject DescriptionsFurther Resources

Because of falling prices, long life, and low maintenance requirements, solar is rapidly becoming the first choice for pumping water in remote locations. This publication gives an introduction to solar-powered livestock-watering systems, including discussions of cost, components, and terminology, as well as some suggestions for designing and installing these systems. The strengths and weaknesses of solar pumping are compared to the main options for pumping in remote locations: mechanical windmills, wind turbines, and portable generators powered by gas, propane, or diesel fuel. Design considerations for freeze protection in water-pumping systems are also discussed. Descriptions of four successful projects and a brief resource list are included.

Remote or off-grid power sources--including solar panels, mechanical windmills, wind turbines, and portable generators--can pump water for livestock in locations where electricity from power lines is unavailable. By encouraging animals to move away from ponds and streams, these systems give livestock greater access to forage. They also reduce livestock pressure on stream banks, preventing nutrient loading, damage to streamside vegetation, erosion, and pollution.

Solar pumping works anywhere the sun shines, and most parts of the United States have plenty of sunlight to run these systems. Solar pumping is a natural match for summer grazing applications, since it produces the greatest volumes of water in sunny weather and during long summer days--exactly when animals need water the most. With proper precautions, solar pumping systems can be used during the winter months too, even though shorter daylight hours will cause reduced water output.

Why should you consider installing a solar-powered livestock watering system on your farm or ranch? These factors may affect your decision:

In 2012, the typical cost for a small to medium-sized solar pumping system suitable for stock watering is $2,000 to $6,000. This does not include installation costs or well drilling. Retail prices for solar panels have dropped dramatically, falling by around two- thirds between 2008 and 2012.

More good news for consumers is that solar pumping systems are eligible for a 30% federal Business Energy Investment Tax Credit. There is no maximum credit amount, and a similar 30% tax credit is available to homeowners. These incentives have been in place since 2005 and are scheduled to last until December 31, 2016. Agricultural producers are also eligible to apply for grants or loans from the competitive Rural Energy for America Program (REAP), administered by USDA Rural Development. Grants are up to 25% of eligible project costs. For more information, visit or contact your state USDA Rural Development office.

Note that conditions and exclusions apply to both the Business Energy Investment Tax Credit and the REAP program. The information above is accurate as of 2012, but rules may change for both of these programs. For current incentives, check with your solar dealer or visit the Database of State Incentives for Renewable Energy (DSIRE).

Even with big price decreases and readily available financial incentives, solar panels are by no means a cheap way to generate electricity. After all, consider the fact that a 100-watt solar panel costing hundreds of dollars generates only enough power to light a 100-watt light bulb. Solar pumping systems are designed to run on low power, usually just a fraction of a horsepower. The four solar pumping systems described at the end of this publication range from 128 to 420 watts, or 0.2 to 0.6 horsepower. If you are familiar with irrigation pumps ranging from several to 100 horsepower or more, you''ll need to scale down your expectations.

Many solar panels on the market today (in 2012) cost under $2.00 per watt, and a set of panels for a small to medium-sized system should cost well under $1,000. However, keep in mind that prices for pumps, racking, wire, controllers, and other components have not dropped. In the case of pumps (discussed at length below), quality has arguably improved, but so have prices.