

Solar wells displacing windmills on Western range

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The pump installer toppled the old windmill in about an hour, first climbing up the wobbly 27-foot tower to stop the broken mill's whirling blade and then pulling the underground pipe to make way for a new solar-powered electric pump.

Iconic mechanical windmills of metal and wood have pumped life into American ranches and farms for 150 years, their function withstanding rural electrification in remote locations beyond the reach of power lines. These days, however, an increasing number of Western ranchers are pulling down their old windmills and converting to solar-powered systems.

"They are displacing windmills everyday," said Scott Blakeley, owner of Pronghorn Pump and Repair in Glenrock, as he traveled to a July installation job on a ranch southwest of Casper. "Primarily because of the mechanical problems that you have. You fix one issue on a windmill today, something else is broke tomorrow. And in August, when you need water the most, the wind blows the least in Wyoming, and in most Western states."

Ranchers use windmills and other pump systems to open more land for grazing by drawing well water for livestock to drink in areas without surface water. Blakeley, who has also installed solar pump equipment in Utah, Montana and Colorado, said the solar segment of his business grows by about 35 percent per year.

Solar-powered pumps have been available for more than 20 years, but their efficiency and durability have recently improved to the point that many ranchers are at least considering the solar option when they need to replace an old windmill or drill a new well.

The cost of solar pumps vary widely, typically running from \$4,500 to more than \$10,000. That often exceeds the typical windmill replacement or repair cost of about \$5,000.

Stand-alone well systems are useful in remote areas where it would be too expensive to extend a power line, a project that costs at least \$10,000 a mile in rugged terrain. When possible, tying into a power line is considered the best option because of the reliability and strength of the power source.

"If (windmills) are working and meeting the needs of the farm, there's not a reason to go change it," said Mike Morris, farm energy team leader for the National Sustainable Agriculture Information Service.

"But when it breaks and you have to do something different, I would think that if you're far from power, solar is going to be extremely competitive if not the best option in many or most cases."

Two of the main benefits of solar wells are their durability and reliability, Morris said. They normally require less upkeep and break down less often than windmills, which include more moving parts that can wear out.

Ranchers using solar wells can accommodate cloudy days by building tanks big enough to hold several days worth of water for their livestock, Morris said. Solar pumps are popular across the country, but are most relevant in the West, he said.

"In the West it's much more common to be far from power," he said. "In the Midwest or East, very often where you need the water, you might be within a quarter mile of power. In that situation, really there is no reason economically to go with solar."

Despite the solar trend, windmills are unlikely to disappear from the landscape. Many ranches that have relied on windmills for generations have the know-how and equipment to keep their windmills operating.

And some companies said their windmill-related sales remain strong.

Peg Muller, owner of Muller Industries Inc., a manufacturer and wholesaler of windmills and windmill parts in Yankton, S.D., said solar wells have had no impact on her business, which sells to customers across the country. Some ranchers don't want to experiment with new systems or are discouraged by the price, Muller said.

"It seems like maybe you lose an account over here and you pick up another over here," Muller said. "It really hasn't affected our business. There are tens of thousands of windmills out there."

For Randy Marton, the Wyoming sheep and cattle rancher who hired Blakeley to replace his broken windmill with a solar

pump this month, the new well's \$4,500 cost was worth it. His ranch has converted its windmills to solar and drilled a new solar-powered well over the past few years, he said.

Marton said windmill repair workers are hard to find and maintenance costs are expensive.

"If you look at the average age of ranchers in Wyoming, they're all getting to be about my age or older _ they're not going to crawl up these windmills anymore," said Marton, 58. "They want things that are reliable, that they can go off and do something else, because there's far less help on these ranches than there used to be and very few young guys left."