



Potential Energy

A few simple options added to your next barn—or some strategic renovations to your existing barn—can conserve energy and leave more money in your pocket.

STORY BY KYLE PARTAIN

In the long list of expenses related to horse ownership, barns rank near the top. They're expensive to build, expensive to maintain, and can have overwhelming energy demands, leading to steep utility bills each month.

But, according to John Blackburn of Blackburn Architects—a firm specializing in equestrian buildings—a strategic approach to barn design and an awareness of cost-cutting, energy-efficient options, can help trim those monthly utility bills, improve a horse operation's bottom line, and even create a more comfortable environment for horses and their handlers.

Lighting

Natural light is your friend, Blackburn says. Natural light requires no electricity and often works better than many current barn lights. The best way to utilize this free source of lighting is through the use of skylights.

"I've been in barns where they'd turn on dozens of lights and I could still barely see my hand in front of my face," Blackburn says. "There's no need to turn on lights in a barn during the day. Natural sunlight should provide more than enough light to do everything you need to do in the barn—if that barn is well-designed."

Barn owners with lofts for hay or other purposes often have to work around those obstructions when putting in skylights, but Blackburn has yet to encounter a barn design where skylights wouldn't work in one way or another.

"We're finishing a barn where they don't even have to turn on lights for the construction crew during the day," Blackburn says. "That's a well-lit barn, and it doesn't require any electricity during daylight hours."

For non-daylight hours, Blackburn recommends fluorescent lights and low-energy bulbs over incandescent lights.

"Incandescent lights can be dangerous and are most certainly less energy-efficient than other bulb types," he says.

Ventilation

"The primary factor driving barn design is the health and safety of the horse," Blackburn says. "To achieve a healthy environment, there are two necessities: natural light and ventilation. People usually add fans in the stalls, or maybe a big fan at the end of an aisle, to circulate the air. But there are things you can do to create natural ventilation—to create wind where there is none—and in turn make a better environment for the horse."

This can be achieved by allowing air to enter the barn at ground level, where it tends to be cooler, and exit as warmer air near the roof.

"I try to place the barn perpendicular to the prevailing summer breeze," Blackburn says, "to take advantage of the wind, when it's available."

Depending on power needs, the solar energy generated might be enough to run the entire farm, including a house or two.

Most horse owners ventilate a barn by opening doors on both ends. This works to some degree, if there's a breeze. But it also helps spread bacteria from one stall to the next, and might lead to horses sharing nasty infections.

"If you can ventilate the air vertically [bring it in low and exhaust it at the roof level]," Blackburn says, "you're less likely to transfer infections and other allergens from one horse to another."

Skylights assist in this process. They warm the air around the skylight, creating a temperature difference between the air near the roof and that near the barn floor. This difference creates lift, which carries air and allergens toward the roof and possible exhaust areas.

"Ventilation now takes the odor and moisture collecting around the stall floor out of the barn vertically," Blackburn says. "It's not like putting a box fan in the stall. Often, a fan isn't required at all. And that means lower energy costs while taking advantage of a natural process that's extremely effective."

Blackburn still believes in using fans in stalls for those days when they're absolutely necessary. One thing he doesn't recommend for hot days, however, is using a mister in combination with a large fan.

"The moisture you're spreading in the barn," he points out, "could create a number of health issues you'd be better off avoiding."

Alternative Power

As "green" buildings grow in popularity, Blackburn has seen more horse owners requesting the use of alternative power options such as solar and wind.

"In reality, I've been designing green buildings for 25 years," Blackburn says.

"I didn't approach it in a way where I just wanted to go green. It came out of my basic philosophy that buildings should fit into their environments both by design and in the use of local and recycled materials."

Most of Blackburn's customers like the idea of using alternative energy sources, but have to back off their ambitious plans when cost estimates start rolling in. In spite of the initial expense of these options, however, they will save horse owners money in the long run.

"We design most barns with a relatively low electrical need," Blackburn says. "Often, we don't heat or air-condition barns at all, so you're talking about a few lights, fans and maybe an office using power in the barn. When you put solar panels on the roof, there's no reason why the power generated can't run the entire barn and even an indoor arena."

« Natural-light sources—such as a row of skylights—reduce a barn's energy needs, and positioning the building perpendicular to prevailing winds allows for natural ventilation, eliminating the need for stall fans.



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Even if you're not ready to make the financial commitment immediately, barns can be designed to make the addition of solar panels easier at a later date. Some ranch owners don't like the aesthetic look of the panels on a barn roof, but this can often be alleviated by placing the barn or arena in a position where panels aren't visible from most of the property.

Another energy-saving option, especially for ranch owners in the West, is the addition of a gray-water retention system.

"When you do get rain out West, often you get it all at once, and then you might not see it again for several months," Blackburn says. "Systems that collect water that runs off barns or arena roofs are useful in these areas. Water can then be reused for a variety of needs around the ranch."

Wind and geothermal power also offer options for those interested in reducing dependency on traditional power sources. Of course, Blackburn's main recommendation is to simply reduce your demand wherever possible. Often, this can be done with proper planning.

"When putting a ranch together, there needs to be some serious thought about the traffic flow," he says. "You can waste a lot of money in time and maintenance with a lack of planning."

Blackburn recommends isolating horse areas from vehicular traffic, and strategically planning where hay and bedding will be stored in relation to your horses' stalls.

"When I start a project, I have the ranch owner fill out an extensive questionnaire that helps determine what they need and how they work," Blackburn says. "It covers everything that affects the operation of the ranch, and allows me to put together an ideal design and flow for the project." 🐾

Kyle Partain is a Western Horseman associate editor. For more information on John Blackburn, visit blackburnarch.com. Send comments on this story to edit@westernhorseman.com.



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