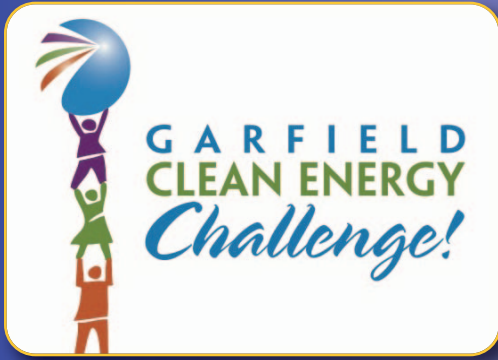


Case Study: Glenwood Caverns Adventure Park

By Bob Ward/CLEER



Efficient Lighting Helping to Preserve Glenwood Caverns' Formations and Save Money

At the Glenwood Caverns Adventure Park, the decision to install energy-efficient lighting was a home run both environmentally and economically.

Owner/operator Steve Beckley had known for years that the incandescent lights in the caves actually put out more heat than light, and that Kings Row, one of the most dazzling formations on the popular cave tour, was beginning to dry out as a result. The key to all of the Caverns' strange and beautiful rock features—not to mention the 54 unique species that live in the caverns (everything from microorganisms to tiny shrimp that inhabit the water in the cave)—is water, which percolates and drips through fissures in the stone. Under normal circumstances,



Tour guide Matt Brown shows off the "popcorn" rock inside the caverns on a recent tour. Photos by Cam Burns

the temperature inside the caverns is a cool 52 degrees Fahrenheit year-round. If the drying were allowed to continue, he explained, "you get a dusty, dry cave instead of a wet, living cave."

Beckley had been waiting for an energy-efficient LED light to appear on the market that delivered the same warm glow as an incandescent without producing so much heat. He finally got his wish in the last year, and immediately began replacing the old bulbs; of the 365 lights in the

cave, he has so far replaced 287, just substituting new LED bulbs as the old bulbs die out.

The new lights are expensive at \$30–50 apiece, but Beckley still expects to save roughly \$12,000 per year when the changeover is complete. First, the new LEDs consume

Lessons Learned

- There are often unique benefits of energy efficiency (like preserving a natural attraction) both by keeping the caves closer to their natural temperature and by not requiring staff members to climb over formations to replace bulbs as often

The Upgrades

- Replaced incandescent bulbs in the caverns with LED bulbs
- **\$12,000 a year savings expected**

far less electricity. Second, they last about five times as long as the incandescent bulbs and thus don't need to be replaced as often and have employees scrambling over delicate features and third, he will continue to have a wet, living cave for years to come.

"These lights are guaranteed for 10,000 hours apiece, so it's greatly reducing the labor cost of replacing the bulbs," he said.

Beckley spent roughly \$11,000 on new LED bulbs, and was reimbursed a total of \$5,000 as a combined rebate from the Garfield Clean Energy's Energy Challenge program and the City of Glenwood Springs Electric Department. By signing up for the program and working with Erica Sparhawk of Clean Energy Economy for the Region (CLEER), a Carbondale nonprofit that provides energy-oriented services to Garfield County residents and businesses, he was able to tap into rebates he didn't know about previously. CLEER provides these services as part of their scope of work for Garfield Clean Energy and the City of Glenwood Springs Electric Department.

"The Caverns is an important part of the Glenwood Springs economy and has the ability to not only save money and energy, but use an efficient technology in a unique environment and preserve these caves for future generations," said Erica Sparhawk, CLEER energy coach that managed the project. Rebates are available to county residents and business owners who make energy-saving improvements to their properties—anything from changing the



Above: Visitors enjoying the better lighting in the "barn."
Inset: The formations known as "Kings Row."

light bulbs to insulating the attic to buying a super-efficient washer or dryer. In Beckley's case, the rebates made an already smart move look long overdue.

"The economics show I should have done it even without the rebate," he said. "I'm happy when anything pays out over a year. I recommend all local business owners undertake whatever measures they can to reduce their energy consumption. And CLEER is the first place to go for help—they do great work."

Beckley continues to explore other energy-saving ideas, including a wind turbine to generate power, or possibly a geothermal or solar thermal system to help melt his outdoor walkways in the winter. Wherever he can reduce the cost of operating the Adventure Park, he can invest the savings in something else. Park visitation has increased from roughly 30,000 in 1999, Beckley's inaugural year, to 150,000 in 2011. This steady growth is at least partly

attributable to the addition of new attractions, from the alpine coaster that speeds down the mountainside to the giant swing that launches visitors high over Glenwood Canyon.

Today, work is underway to expand the tour options in the Park's namesake caverns, which Beckley can illuminate at a lower cost, with less risk to the cave's ecology.

"We began with 7,800 linear feet of passageway, and now we have about 16,000," he smiled. "This cave has been open since 1999, and I want to make sure your grandkids can still come. Our job is the stewardship of this cave."

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