

Case Study: Bear Creek Mountain Resort

Bear Creek Mountain Resort, Macungie, PA

Sage Energy worked with the Bear Creek Mountain Resort, located in Macungie, Pennsylvania, to determine how the resort might best become more energy efficient while minimizing or alleviating the impact on guest experience. Bear Creek Mountain Resort & Conference Center is a year-round resort nestled on 330-acres in scenic Berks County, Pennsylvania. Along with meeting and banquet facilities, restaurants, a spa, and indoor and outdoor pools, the resort offers snow sports in the winter, and hiking, biking, boating, tennis and golf during spring, summer, and fall. Sage Energy provided a preliminary energy audit to help the resort understand what benefits could be gained through “no-cost” suggestions as well as through some longer-term energy conservation measures that could be implemented and utilized year-round.

While the resort was very well maintained and operated, there were several opportunities to help them reach their energy efficiency goals using newer technologies than those currently employed. Among them were:

- Executing controls systems modifications
- Utilizing occupancy sensors in rooms for lighting efficiency
- Installing a cooling tower and heat exchanger for a water-side economizer (“free-cooling”) cycle
- Performing laundry washer ozone bleaching and dryer waste heat recovery

The energy audit also uncovered a number of cost-effective energy conservation measures (ECMs) that were not already under consideration, such as utilizing a wood-fired boiler, given the resort’s location. Likewise, Sage Energy suggested measures aimed at reducing energy consumption during periods of low or no occupancy in many of the conference center rooms as well as the guest rooms.

No-Cost Operational Measures

Sage Energy suggested that the resort review and become more aggressive in their set points and sequences of operation with regard to their HVAC plant and how to efficiently maintain comfortable temperatures indoors when the temperatures outside were moderate.

Low-Cost Lighting Measures

In the area of lighting, Sage Energy was able to recommend plans for aggressively utilizing occupancy sensors in non-guest areas and common areas, as well as recommending using compact fluorescent lamps to the extent possible.



Sage Energy also recommended installing a cooling tower and heat exchanger for a water-side economizer (“free-cooling”) cycle. Instead of using the chiller to cool the circulating chilled water, the cooling tower would be the cooling source whenever the outside air temperature was below 40 – 45°. With the chillers spending a large amount of time at a relatively low load, the payback period could be attractive, since most of the savings would occur at low loads, when a reciprocating, air-cooled chiller is least efficient.

Laundry System Energy Measures

In the facility’s laundry, Sage Energy suggested installing ozone bleaching systems. Advances in ozone generation technology have created the opportunity for significant chemical, water and energy savings in laundries of all sizes. The ozone system would virtually eliminate bleach use and hot water consumption, and reduce total chemical consumption by a significant amount. In addition, Sage Energy suggested investigating recovering the waste heat from the dryers and using it to preheat the air entering the dryer. Research has indicated that up to 25% of the dryer fuel input could be saved using this method.

Renewable Energy Measures

In the area of renewable energy, in addition to recommending installation of solar photovoltaic panels for electricity generation, Sage Energy suggested that BCM consider a wood-fired boiler system for the resort. This could be done for half the price of propane. Because BCM is in a rural area, supplies of waste wood chips, either from logging or landscape/utility tree-trimming operations would be available in such quantities as to support a boiler system entirely fired by wood. There are many, small wood boiler systems that cleanly burn wood, unlike a standard wood stove that may allow wood to smolder and create smoke. A wood boiler system would utilize a locally-sourced renewable fuel.

Through their efforts, Sage Energy helped the Bear Creek Mountain resort facilities department, operations and maintenance department, and resort management understand the benefits of these energy efficiency upgrades. The energy audit also helped them realize the positive impact on the resort’s budget, along with the resulting positive response from guests regarding the resort’s goals towards sustainability.

Project Summary

Sector: Hospitality

- Energy-saving lighting, including fluorescent and compact fluorescent fixtures and motion sensors and computer-controlled systems turn off lights in unoccupied areas.
- State-of-the-art power and HVAC control systems minimize heating, cooling and electric usage
- Cooling tower and heat exchanger for a water-side economizer (“free-cooling”) cycle
- Laundry washer ozone bleaching and dryer waste heat recovery
- Wood-fired boiler as a source of renewable energy

Incorporating Sage Energy’s expertise in creating innovative solutions for energy savings and efficiency into Bear Creek’s long-range sustainability plan has positively impacted both the resort’s operational efficiencies and their bottom line, while minimizing the effects on guests. Contact Sage Energy to find out how your business can benefit – 410.268.0511 or info@sage-energy.com.