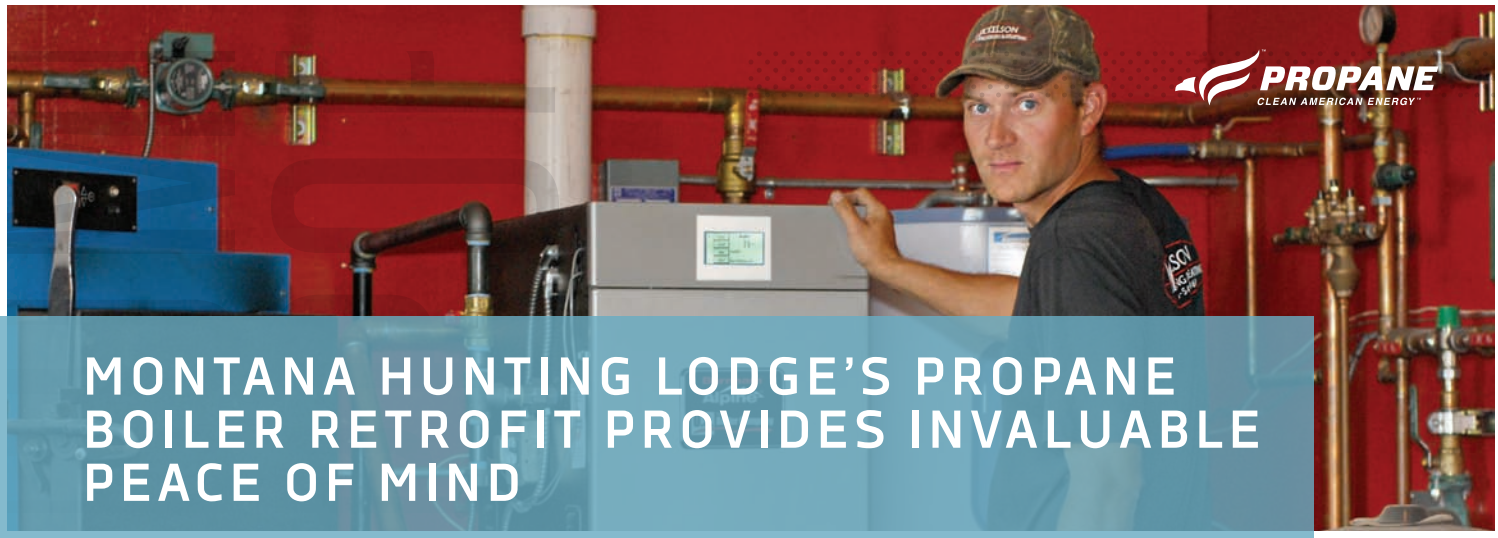

MONTANA HUNTING LODGE'S PROPANE BOILER RETROFIT PROVIDES INVALUABLE PEACE OF MIND

Andy Mickelson, owner of Mickelson Plumbing and Heating, in the Carrs' mechanical room.

A PROPANE CASE STUDY

For hunting guide Cody Carr, adding a propane-fueled boiler to his wood-fired hydronic system allowed him to focus on what's important: his family and his business.

BACKGROUND

In the rugged landscape of western Montana, outfitter Cody Carr's Hunting Adventures provides world-class hunting for elk, mule deer, bear, cougar, and turkey. On their property in Sanders County, owners Cody and Koliss Carr have their own house as well as a guest lodge with gorgeous mountain views, serving hunting clients and vacationers.

CHALLENGE

With their growing business requiring additional space for vehicles, equipment, and an office, the Carrs built a central shop to accommodate all the gear previously stored in outbuildings spread across the property. The shop included a central plant for a new hydronic heating system that would serve the 2,700-square-foot shop, both levels of their home, and the entire guest lodge — 8,000 square feet in all — and provide domestic hot water for the three buildings. The system was initially fed entirely by a wood boiler, as the Carrs had access to plentiful and inexpensive local softwood.

Of course, the wood boiler had an appetite for fuel, and when the Carrs were out for long periods of time during the hunting seasons, that left them with a challenge.

Andy Mickelson, owner of Missoula, Montana–based Mickelson Plumbing & Heating, was brought in to examine the system and recommend a solution.

The initial system design had called for the wood boiler to run throughout the day, storing excess energy in an 800-gallon Niles buffer tank that would supply the heat needed through the night and into the morning. "Once it was in operation, they found that the immediate need for Btus — especially in the cold Montana winters, when temperatures can reach -20 degrees — made it difficult to generate excess heat," Mickelson says.

"It was also getting annoying for the Carrs to go out and put wood in the boiler at night so that they'd have hot water in the morning," Mickelson adds.

Maintenance on the boiler was also more onerous than expected. Because it was running nearly full-time, it required cleaning every 10 to 14 days, a process that involves time to shut the unit down, cool it off, and disassemble and clean it. If it wasn't regularly maintained, the sooty boiler caused system shutdowns.

The challenge was heartbreakingly compounded when the family's oldest

COMPANY
Cody Carr's Hunting Adventures
Sanders County, Montana

CHALLENGE & SOLUTION
When feeding and maintaining the wood boiler for his 8,000-square-foot home and guest lodge complex became an unexpected burden, Cody Carr hired Mickelson Plumbing to add a worry-free backup system that would keep his business running. Mickelson installed a high-efficiency propane-fueled boiler with a sophisticated control system that could seamlessly switch from wood to propane heat.

RESULT
By using a propane boiler, the Carrs save approximately:

- 54% compared with electricity
- 32% compared with heating oil
- Additional savings for maintenance and installation.

And while wood is plentiful in Montana, the propane boiler has been a priceless addition, proving to be even more affordable and convenient than expected — and taking a time-consuming task off of the owners' crowded plate.

daughter was diagnosed with Guillain-Barre syndrome, a rare disorder that took her to a critical care facility in Spokane. Needless to say, feeding a wood boiler during heating season was an unwelcome task while the Carrs tended to their recovering daughter.

SOLUTION

Mickelson and the Carrs quickly decided that a new boiler for backup heating was an absolute necessity. With no natural gas available on their remote plot, Mickelson recommended a 95-percent-efficient Burnham Alpine boiler fueled by propane. A local propane retailer installed a 1,000-gallon tank behind the shop, and Mickelson simply ran 15 feet of gas line to supply the boiler.

Mickelson designed the sophisticated heating system so that it can be run seamlessly using the wood or the propane boiler. He plumbed the new boiler into the supply for the well-insulated buffer tank, which distributes hot water throughout all three buildings using Watts manifolds and 1 ½-inch R-Flex supply-and-return tubing installed underground.

Taco pumps and zone controls direct the water where it is needed: through in-slab radiant tubes, Modine Hot Dawg H20 hydronic unit heaters, and Magic Aire hydronic heating coils in the home's ductwork. A two-stage Honeywell T775 programmable controller with outdoor reset switches the system to propane heat when the wood boiler isn't running.

In the summer, the guest lodge switches entirely to propane for domestic hot water. "They use a propane-fired tankless water heater that provides all their shower water when there's not any advantage to firing up the boiler and keeping that 800-gallon buffer tank going," Mickelson explains.

RESULTS

Propane provides reliable, affordable heat.

Mickelson considered using an electric or heating oil boiler for the heating system, but he determined propane was a better, more cost-effective solution. Accounting for efficiency and energy price, heating with propane cost approximately $1.47 per therm, while electric would have been roughly $3.19, a 54 percent savings. Plus, an electric boiler large enough to meet the 400,000-Btu-equivalent demand would have required a substantial service size — about 120 to 130 kilowatts. "In their location, obtaining a tremendous amount of single-phase power would have been a challenge and costly," Mickelson says.

A propane boiler was also less expensive to maintain and more efficient than fuel oil options. The propane boiler provided energy savings of 32 percent over fuel oil (about $2.17 per therm), and the savings in routine maintenance would be even greater.

Propane provides resilience and peace of mind.

Having both wood and propane stored onsite provides the Carrs with two sources of fuel that aren't dependent on unreliable power lines. Closing the lodge or leaving guests without hot water during an outage are unacceptable options. With propane, Mickelson says, "you can walk out to the tank and say, 'Okay, we have 50 percent left, we have plenty of fuel for the next four days with clients coming in.'"

Unlike wood, however, propane is not a day-to-day concern. With 8 to 10 employees busy taking care of the chores needed to prepare for a hunt, having to feed the wood boiler became a burden. The option of seamlessly transitioning to propane allowed the owners to relax and focus on work and family as their daughter made a significant recovery.

"We were able to bring our daughter home part of the way through the heating season, but I was busy with clients by that point," Cody Carr says. "We burned wood when we had time, but I was impressed by how little propane the new boiler actually used. And especially with the low prices we saw over the winter, it was infinitely more convenient to let the gas boiler heat the property."

For business owners in remote parts of the country, choosing between wood or propane — or both — comes down to their appetite for maintenance and labor. "If you really enjoy splitting wood and stacking wood, wood's a good solution for you," Mickelson says. In this case, propane was the right call. "Having that propane option and not even thinking about the wood boiler was probably a huge weight lifted off of them to eliminate a fairly significant daily task."

FOR MORE INFORMATION

To learn more about propane-powered appliances and the Propane Education & Research Council, visit **www.buildwithpropane.com**.

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