

Stone House Lodge – Electrification



We provided a technical study for Stone House Lodge to demonstrate energy savings through electrification. Electrification as a Win-Win-Win strategy.

- **Win 1 – Energy Reduction.** Energy efficient electrical equipment and appliances reduce energy use to a practical minimum. Then fuel switching from propane to electricity allows the use of heat pump equipment leveraging efficiencies of 200%-350%.
- **Win 2 – Lower Cost.** With electrification in place, renewable Solar PV electricity generation offsets electricity bills
- **Win 3 – Emissions Reduction.** Green House Gas emissions are nearly eliminated since the solar PV will offset all electricity consumption.

The transition to all-electric presents multiple challenges and needs to be approached deliberately to provide an economic payback. For example, current heat pump water heaters provide a simple payback within three years, but are most efficient when operating above 40F. The Rio Arriba, NM climate mandates the water heater be located within the building envelope. This means that the heat gained by the water heater is pulling from the living space. This is a cooling benefit in the summer, but requires additional HVAC heat pump capacity in the winter.

Another indirect challenge stems from the Stone House Lodge location in rural Rio Arriba county. The solar PV system providers were eager to give quotes though all done remotely and without review of the entire project goals. It took deliberate effort to convince them to design a system to meet the anticipated future electric load, which was significantly higher based on the fuel switching, opening a restaurant, and moving to 12 months per year operation.

Our study found that Stone House Lodge electrification and energy efficiency improvements provided a 26% reduction in energy use from all fuel sources (measured in BTU/hr). The addition of solar PV

generation and the NM net metering regulation will eliminate all but the fixed costs from their electric bills and provide a simple payback under 10 years. With current incentive programs the real payback is projected to be less than three years.