

Project Title: Supplemental Sources of “Green” Energy for a Hot Tub

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Area: Mechanical Engineering

Sponsor: Master Spas

Master Spas is the world’s largest spa manufacturer and leader in the hot tub industry. Hot tubs currently receive energy through conventional hookup to the power grid, which makes a noticeable increase in the energy consumption of a consumer’s household. Master Spas is looking to improve energy usage specifically with their most popular hot tub model, Twilight Series 7.2, by incorporating a “green” energy source that will provide supplemental power to operate in standby mode. While in standby mode, the hot tub is required to continue running its regular filtration cycles and maintain a water temperature of $102^{\circ}\text{F} \pm 2^{\circ}\text{F}$.

The goal of this project is to determine, design, and build a “green” alternative energy solution to reduce the consumer’s energy consumption and provide 50% or more of the annual power consumption in standby mode. That will be a minimum of 854 kWh per year. Additionally, the solution must provide a return on investment to the consumer of less than or equal to five years. The budget for this project is \$10,000.