



# ReVISION House™ Orlando 2011

**Manufacturer:** Rheem ®  
**Product:** Hybrid Heat Pump Water Heater  
**Category:** Water Heater



In a typical home, the energy used in domestic hot water heating is one of the largest components of total energy use on an annual basis. In an exceptionally energy-efficient home, it is often the largest energy use, sometimes even higher than both space heating and cooling combined. The reason for this is simple - to make homes more efficient we must lower the loads (by improving the building envelope) and then apply efficient equipment to meet those reduced loads. Lowering the load and reducing hot water usage is difficult to accomplish and aside from behavioral adjustments does not usually change beyond a small percentage. The primary objective then becomes to find a more efficient means of generating hot water.

The ReVISION House™ Orlando began with a basic, inefficient hot-water system: a 40-gallon electric tank. The tank had an efficiency factor (EF) of .88 consumed 3,276 kWhs each year (based on a typical occupancy and use schedule). This is the equivalent of burning thirty-two, 100-watt incandescent bulbs for 1000 hours every year. Demand reduction strategies such as low-flow fixtures and Energy Star appliances were selected because they require less water usage. The fixtures and appliances can only account for so much of the energy savings. After that the focus has to be about creating hot water with less energy. Because the ReVISION House had no natural gas option, the teams' choices were more restricted to electric alternatives. Fortunately, the relatively recent market availability of heat-pump water-heaters (HPWH) provided us with an excellent alternate.

Heat-pump water heaters work by capturing the heat from the ambient air in the space the HPWH is located in. The heat-pump extracts that heat the same way an air-conditioner extracts the heat from a house to cool it. However, instead of dumping the heat to the outside, the heat is collected and placed in a water storage tank. With several products on the market, the design team selected the Rheem Hybrid Heat water heater. The 50-gallon storage capacity tank is well insulated to minimize stand-by losses, and is rated with a high 2.0 EF (energy factor). That's more than twice as efficient as the electric tank it replaces. Additionally, because the tank resides in an un-air-conditioned garage in Orlando's typically warm temperatures, the energy performance of the tank is anticipated to be even higher than the rated performances. The higher the ambient air temperature, the higher the performance.

Overall the ReVISION House team expects the annual energy use for hot water to be reduced to 746 kWh from the original 3,276 kWh. That is more than a 75% reduction - outstanding results from a simple solution.