



COLD CLIMATE HOUSING RESEARCH CENTER

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ENERGY FOCUS

My shower time is a reprieve from the winter doldrums. I'm a better person for it; I'm more functional and less likely to stay in bed groaning for, say, three or four months. The problem is that my love of hot water costs me a lot of money. My electric 40-gallon hot water tank costs about \$40-\$50 per month to operate, which is more than half of my total monthly electric bill. Would I save money if I installed a so-called tankless, or on-demand water heater?

First, some basics about on-demand systems. Much smaller than the average tank model, which heats and stores hot water throughout the day (and loses a lot of that heat to the surrounding air), on-demand systems use small reserve tanks or no tanks at all. Instead, these heaters turn on only when there's a demand for hot water, heating water as fast as you use it. A properly sized unit can deliver all the hot water you need even if your source water is just a tad above freezing. And, a well-maintained unit that uses relatively mineral-free source water or is attached to a functioning water softener will not clog up.

Oil- or gas-fired units are more cost-effective than electric units, but all will outperform a tank-type heater using the same energy source. According to the U.S. Department of Energy, on-demand water heaters are up to 30 percent more efficient than traditional tank-type heaters because they don't suffer from standby heat loss. If the incoming water is extremely cold or a household has multiple and simultaneous demands for hot water (e.g., showering and doing the laundry at the same time) two units can be installed in tandem. In fact, this method can produce water that's so hot that it can become necessary to install a thermal regulator on the water line to prevent scalding.

When building a new home, an on-demand water heater is clearly the way to go. The extra money spent to purchase and install a high efficiency on-demand water heater amounts to just a few dollars each month on a mortgage, yet shaves hundreds off an electric bill annually. Plus, an on-demand system contributes to the overall energy rating of a new house and can qualify for tax credits or other rebates. Popular units available locally include Toyotomi's Oil Miser series and Quietside models, which combine space heating and on-demand water heating functions. Additional brands are available at large chain stores such as Home Depot or Lowes.

When shopping for an on-demand unit, you'll need to know how much hot water you require at peak use times (measured in gallons-per-minute), the incoming water temperature, and your household's water pressure, which must be strong enough to trigger the heater. Match these numbers to the manufacturer's product specifications. Electric on-demand systems often require a specially wired circuit to provide adequate power.

Replacing an existing water tank with an on-demand unit is not as attractive financially, but still might be worth doing, especially if a tank is at the end of its service life or needs repairs. A retrofit will likely require maneuvering some pipes around. On-demand units can be bought for between \$1,200 and \$2,000. If purchased and placed in service in 2009, certain models can qualify for \$300 in federal tax credit. The expense goes down further if a certified Alaskan energy rater recommends an on-demand system as a way to improve the total energy efficiency of your home.

Finally, if you must purchase a tank-type water heater, buy one with a heavily insulated tank that has a thermal resistance value (R-Value) of at least R-25. For gas- or oil-fired tank heaters, find one that uses a draft-induced fan to regulate the air that passes through the burner to optimize combustion. A sealed combustion system, which draws air from the outside and has a sealed vent, will make your tank even more efficient. That is, if you can get out of bed to enjoy your shower.