Tankless Water Heaters

- **Cost slightly less to operate**
  A tankless water heater is slightly more efficient and can reduce water heating cost from $25-27 monthly to $23.

- **Output temperature limited by flow**
  High water-flow uses like showering and dishwashing simultaneously may result in reduced water temperatures.

- **High cost**
  Initial cost of whole-house models is $600 – 700, plus installation, plus electrical upgrade. Electrical wiring, breakers, and panel upgrades add substantially to the cost.

- **Ideal Applications**
  Small tankless water heaters are well-suited for low-flow uses in remote applications, such as a hand-washing sink in a distant corner of a large building.

- **Alternative savings**
  Reduce the thermostat setting on your existing water heater. If you have an older model, consider additional insulation, a "water heater wrap or jacket'. When the time comes to replace your existing water heater, purchase a model with an efficiency rating of 0.94-0.95

The bottom line:

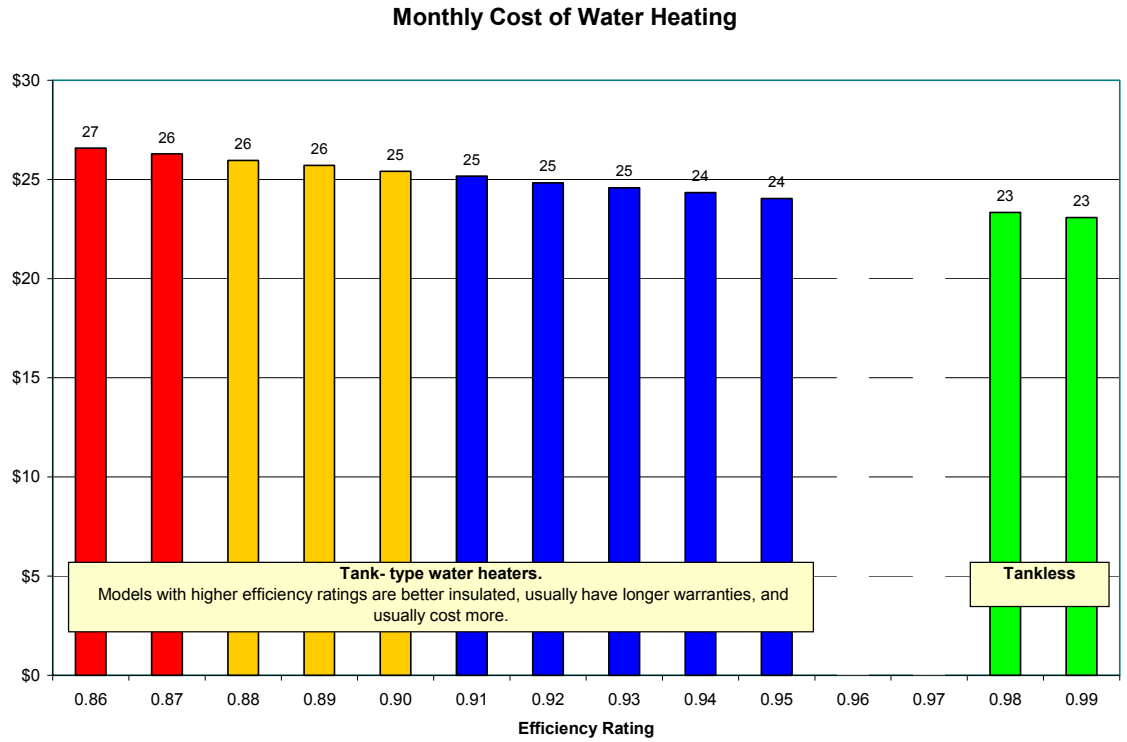
Tankless water heaters cannot be justified on the basis of reducing water heating cost. Our calculations indicate expected paybacks of more than 25 years. However, other factors, such as suitability for a particular application may make tankless a wise choice.

The conclusions summarized above are based on evaluation of several sources. For details on how we came to these conclusions refer to following pages.

Analysis of Tankless Electric[1] Water Heaters

Cost less to operate

The cost of heating water for the "average"[2] family of four is about $25-27 per month[3]. A tankless water heater will save $2-4 dollars per month.



The majority of the cost to operate a standard electric water heater is to heat incoming cold water as the hot water is used. This will be the same with either type of heater. However, 5-12% of the total energy input is lost through the outside surface of the standard heater. The tankless models are more efficient because they eliminate these "standby losses".

Sales literature for tankless models often claim 20-30% standby losses. By overstating the losses, they exaggerate the savings. However, the efficiency rating on standard electric water heaters tells us what the actual losses are. Most electric water heaters are rated between 0.88 and 0.95 efficient (88%-95%); so the losses are 5-12%.

[1] *This evaluation considers only electric water heaters.*

[2] *Average usage information and efficiencies were taken from the March 2005 edition of the Consumers' Directory of Certified Efficiency Ratings published by GAMA.*

[3] *VEC's cost per kWh ($0.6286) was used.*

Sizing

It is important to select the proper size unit to provide the amount of hot water you need. To do this you need to know the starting temperature of your cold water and the desired flow rate.

In our area, the winter temperature of the water from public water systems is about 50° F.

The table below will help in choosing a flow rate. Remember to add together any devices that will operate simultaneously.

Device	Flow Rate (gals per min)
Faucets	0.7 – 2.0
Low-flow shower head	1.2 – 2.0
Standard shower head	2.5 – 3.5
Clothes washer	1.0 – 3.0
Dishwasher	1.0 – 2.0

Assume that our usage added up to 3 gpm, and that we needed 115º F. water. We would have to select a size that provides a 65º temperature increase at a flow rate of 3 gpm. By evaluating product literature we find that a 28 kW is needed.

A tankless water heater has no reserve. If additional devices are turned on and the flow rate exceeds the design rate, the water temperature will drop proportionately.

Cost to install a tankless water heater

The initial cost of whole-house 28 kW model is $600 – $700 plus installation.

Installation of a whole-house model will require substantial upgrading of the electrical system. Most of them use (3) 9 kW heaters so (3) 50 amp breakers have to be added. Since most breaker boxes do not have this much capacity, a new box must be installed. Usually three runs of #8 Cu wire from the box to the water heater will also be required. **It is important to discuss the installation with an electrician before purchasing a unit.**

(A one-sink model (1.0 gpm, 10 kW) is around $160 plus installation and electrical.)