5.2.5 Barriers to Further Penetration

Several barriers inhibit further market penetration of the HPWH. **Low visibility of energy use for water heating** has subdued demand for improved water-heater efficiencies in general. Consumers are largely unaware of the cost of heating water and do not pay attention to their water heater until it needs to be repaired or replaced. The lack of consumer awareness of the energy saved by HPWHs could be alleviated by the addition of an energy metering device to the heater or by better information outreach.

Another major problem is **the high initial cost of the product** due to small-scale production. The combination of the information and cost problems creates the HPWH industry's dilemma. There is insufficient demand for the product, presumably due to the lack of consumer's knowledge and the high price of the product, for it to be profitable to increase the scale of production. Therefore, the price of the product remains high, which is one of the reasons that there is insufficient demand to begin with. However, any attempt to increase the demand for the product with an informative marketing effort will be unsuccessful due to the high initial cost of HPWHs, and the cost of the marketing effort. This marketing cost would be too large of a burden for these small firms to bear without passing the cost onto the consumer, so the price of the product will increase. This increase in the price of HPWHs, which already is perceived as too high, would make the payback from energy savings longer. Thus, the demand for the product will be lower, which would counter the increase in demand that the marketing effort was to generate.

Plumbers and HVAC service personnel are poorly trained in the heat pump technology. They therefore do not actively promote the product, and qualified servicing is often unavailable. Maintenance requires skills in refrigeration, electrical wiring, and plumbing that often go beyond