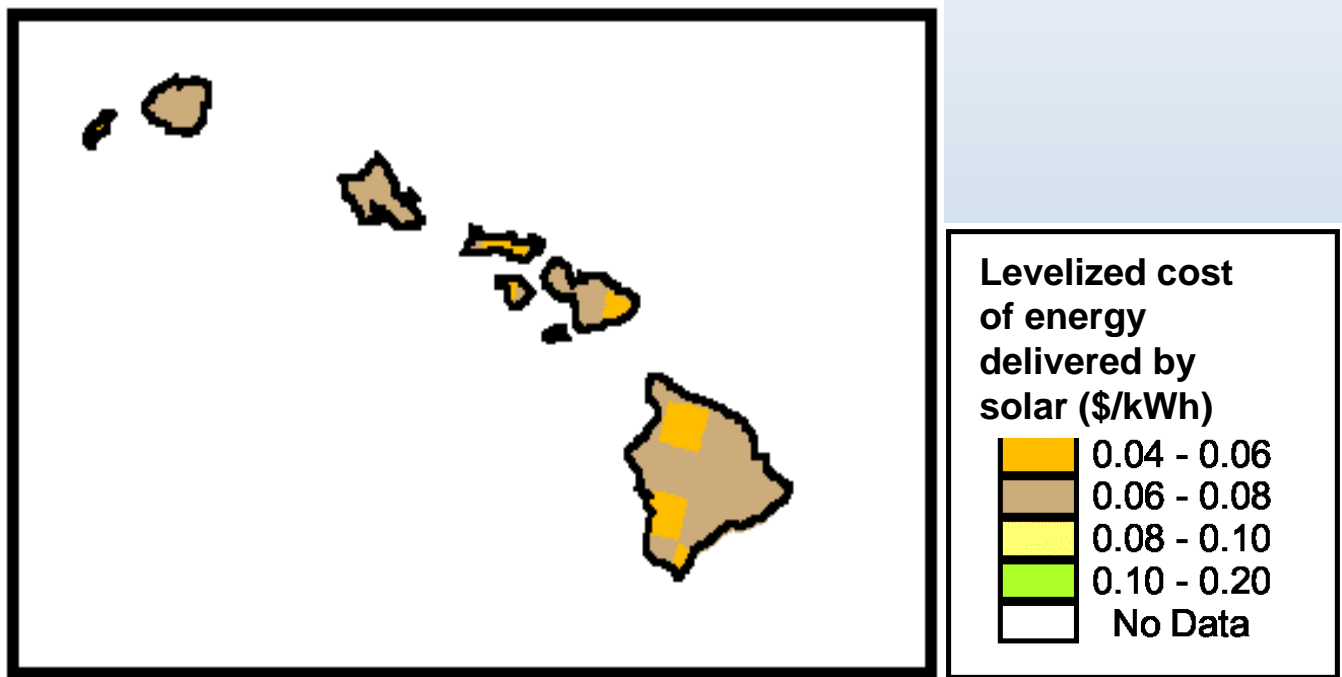


Cost-Effectiveness of Solar Water Heating in Hawaii

Andy Walker PhD PE
National Renewable Energy Laboratory
March 19, 2008

Cost-Effectiveness is defined as a life cycle savings greater than life cycle cost. The figure below presents the cost of energy at which a solar water heating system would be cost effective under the following conditions:

- 1) solar water heating system cost of \$900/m² (\$84/sf)
- 2) A discount rate (time-value of money) of 5% per year
- 3) An energy cost escalation rate of 2% per year
- 4) Solar water heating efficiency of 40%
- 5) A 25 year analysis period



In sunny parts of the islands, solar water heating can deliver heat at a levelized cost of \$0.04 to \$0.06/kWh. In less sunny areas the range is \$0.06 to \$0.08/kWh. Electric customers in Hawaii pay at least \$0.15/kWh, depending on utility and customer class.

In conclusion, solar water heating is cost effective at any location in the Hawaiian Islands under current conditions. Simple payback periods range from 8.5 years to 4.3 years, again depending on utility and customer class.