

Natural Gas and Water Savings Opportunities in Hot Water Heating System

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Summary Recommendation

- Form a subcommittee to look at water heating as a system and identify program opportunities- membership of utility and ee experts
- Develop one or more programs to comprehensively address savings opportunities in cost effective 3 year plan
- Bring those programs back to the portfolio administrators for incorporation into 2006-2008 program funding request.
- Do this in time for inclusion in the 2006-2008 plans

What Do You **Need** from your **Hot Water** System?

- Clean clothes
- Clean dishes
- Clean hands
- Clean body
- Relaxation
- Enjoyment

The **service** of hot water

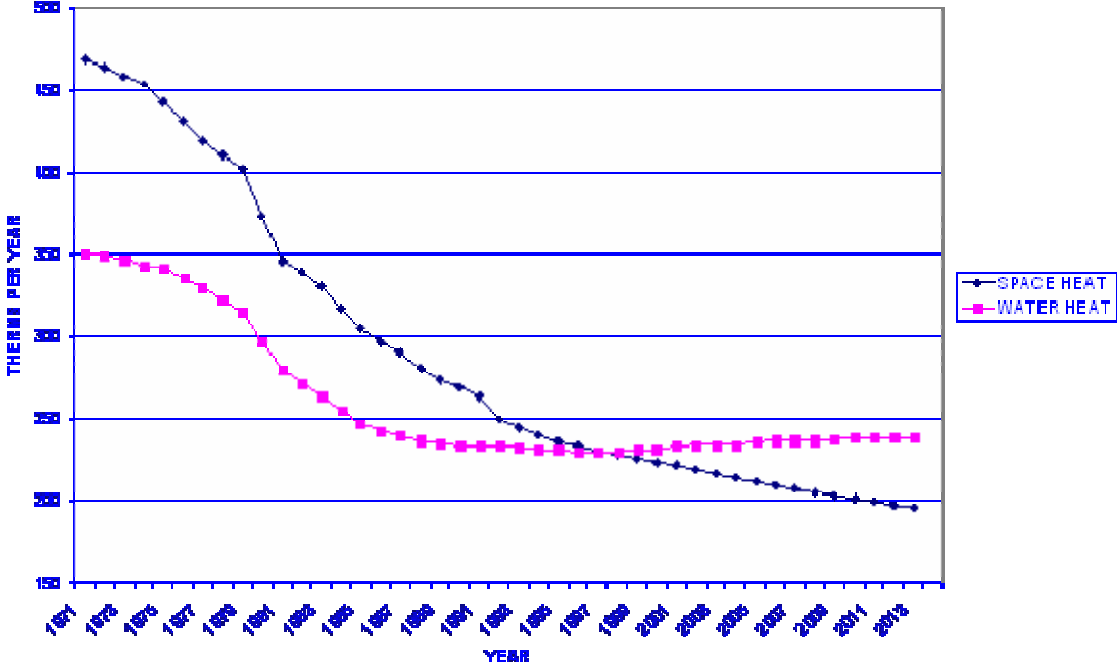
The Hot Water System

- Treatment and Delivery to the Building
- Use in the Building
 - Water Heater – the source(s) of heat
 - Piping – the means of delivery
 - Fixtures and Appliances
 - Behaviors
 - Water Down the Drain
- Waste Water Removal and Treatment

Achieving Natural Gas Savings Goals will require mining savings from the domestic hot water end use

- Significant savings have been achieved in space heating but water heating UEC's are flat over last decade.
- See Chart next page

MARGINAL Gas UECs for all res homes in the SCE area

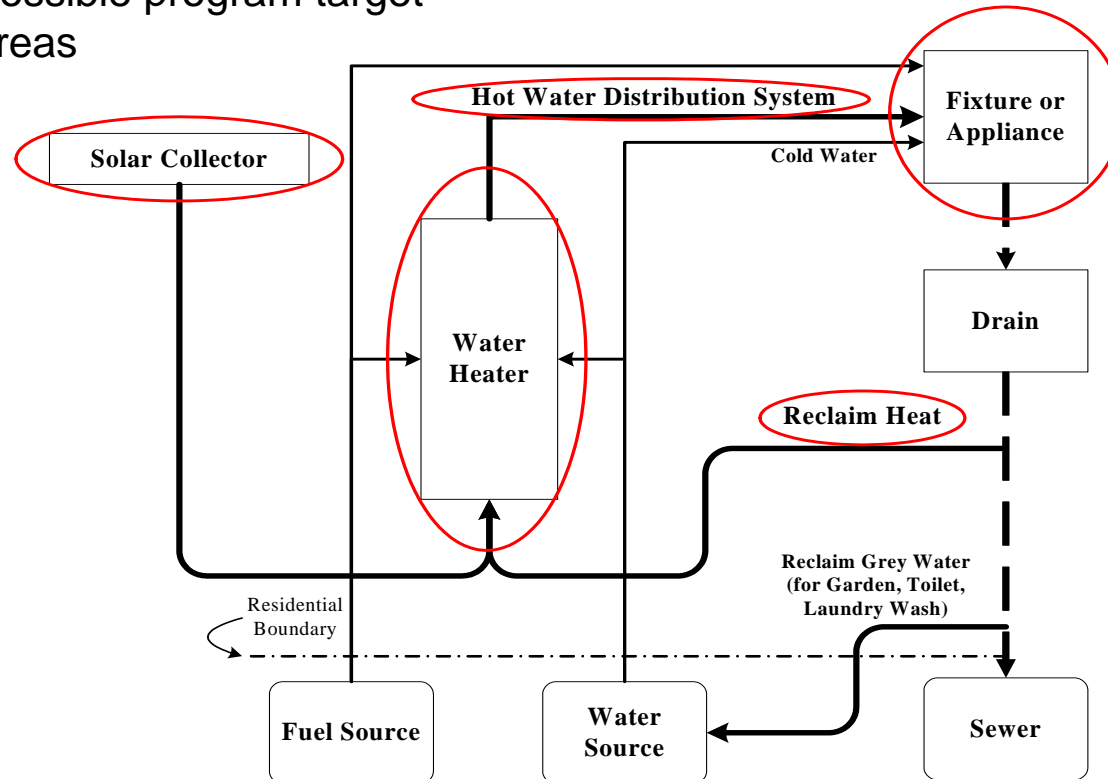


Savings Opportunities

- Increase energy factor of existing gas water heaters (See R Mowris proposal for upstream water heater program)
- Look at the system and increase structural efficiency by reducing waste (PIER projects underway?)
- Structured Plumbing designs improve material utilization efficiency and system performance
- Demand recirculation, pipe insulation, more water efficient fixtures and appliances and drain heat recovery reduce demand for hot water (Emerging technology)
- More efficient water heaters, boilers and boiler controls reduce the energy needed to meet this demand ??

Improved DHW System

- Possible program target areas



Single Family-New Construction

- Potential reduction in water waste of 90%
- Savings are roughly double that of the clothes washers
- Plumbing design, pipe insulation, demand recirculation and drain heat recovery are part of the package
- Combination of training and incentives
- Go after all new homes in your service area, particularly larger, more spread out designs and those with planned recirculation systems

Single Family-Retrofit

- Potential reduction in water waste is somewhat limited because it is unlikely that the plumbing will be reconfigured.
- Savings are similar to the clothes washers
- Install demand recirculation pumps and insulate all reachable hot water pipes
- Combination of training and incentives
- Focus on bigger, newer houses, also those with existing recirculation systems

Multi-Family-New Construction

- Two types: with and without central water heaters
- Plumbing design, pipe insulation, demand recirculation and boiler controls must all be part of the package
- Combination of standards, training and incentives will work
- Go after all new multi-family developments in your service area

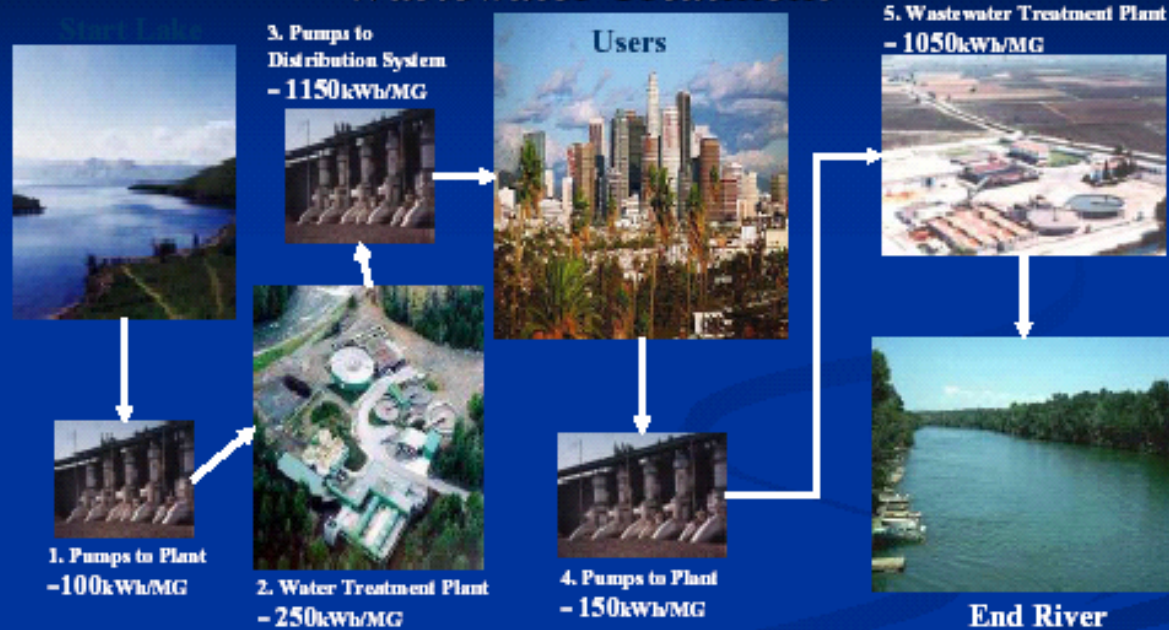
Multi-Family-Retrofit

- Potential reduction in water waste is somewhat limited because it is unlikely the plumbing will be reconfigured.
- Insulate all reachable plumbing, particularly in the loop
- Demand recirculation will save 75-90% of the cost of operating standard recirculation pumps
- Boiler controls will save energy by lowering the water temperature in periods of off-peak use
- Work with large apartment management companies
- Look for those apartments that have central water heaters and no recirculation system

The Water-Energy Connection

- The Energy Commission is looking at this connection in the context of the 2005 Integrated Energy Policy Report
 - Preliminary numbers on the next page.
 - Saving water, whether hot or cold, saves energy
- It would seem valuable to allow energy utilities to account for energy savings due to water conservation
- Joint programs with water and waste water agencies, both public and water IOU should be encouraged
 - Accounting for both often makes the overall program more beneficial. See example from a recent workshop on the water-energy connection

Typical Energy Use In Water & Wastewater Treatment



	Step 1	Step 2	Step 3	Step 4	Step 5
Accumulating Total	100kWh/MG	350kWh/MG	1500kWh/MG	1650kWh/MG	2700kWh/MG



Suggested Next Steps

- Form a subcommittee to look at water heating as a system and quantify opportunities
- Develop one or more programs to comprehensively address this issue- (ef of water heater, system design, controls, pipe losses)
- Bring credible programs back to this group for a decision (see my domestic proposal for details)
- Do this in time for inclusion in the 2006-2008 plans